

Executive Summary

The 2008 TRI data represents the 22nd year of data collection from facilities for distribution to the public, and the TRI program continues to fulfill its goal of providing chemical use, release, and waste management information to the public. The increased attention given to releases and management of chemicals through the TRI reporting requirements continues to drive an increase in knowledge about the releases, as well as efforts to achieve reductions in releases.

For 2008, total on-site releases reported in Delaware show a decrease of 1,200,000 pounds (11.3%). We saw significant decreases in releases of hydrochloric acid from two electric generating facilities, and 17 facilities reported on individual chemicals with decreases in on-site releases of greater than 10,000 pounds, including 6 reports with decreases greater than 100,000 pounds. Overall, results from the 2008 TRI data show (most amounts rounded to the nearest 1,000 pounds):

- The total amount of TRI chemicals reported as released to air for 2008 decreased by 1,149,000 pounds (17%), compared to 2007. The largest change in this category was hydrochloric acid aerosols released from the Indian River and Edge Moor power plants, which together reported 721,000 pounds (16%) less than their 2007 amounts. Indian River burned lower sulfur bituminous coal in 2008, which contributed to lower TRI on-site release amounts of sulfuric acid, while the Edge Moor Power Plant ran decreased power production for 2008, reporting lower releases of hydrochloric and sulfuric acid.
- The total amount released to on-site water decreased by 531,000 pounds (16%), including nitrate compound reports from the INVISTA facility, which reported a reduction of 210,000 pounds (46%), and from Premcor Refining with a reduction of 171,000 pounds (7.4%).
- The total amount released on-site to land increased by 480,000 pounds (118%). This was the primary result of the Indian River Power Plant disposing of its ash in its on-site landfill instead of sending it off-site. Because the amount of TRI chemicals reported as sent to its on-site landfill increased by 452,000 pounds for 2008, total off-site transfer to disposals from the facility dropped by 418,000 pounds for 2008.
- The trend for on-site release of carcinogens increased by 76,454 pounds, or 33%. This reverses a 5-year downward trend in on-site releases of carcinogens.
 - Reported release of chromium compounds increased by 47,000 pounds, the result of the above-mentioned Indian River Power Plant disposal.
 - Reported releases of vinyl acetate released to air, primarily from the Formosa Plastics facility, increased by 3,900 pounds, 13% more than for 2007.
- Overall, the trend for on-site release of persistent bioaccumulative toxins (PBTs) was up by 12,665 pounds, or 60%.
 - Reports of lead compounds released to land increased by 13,598 pounds for 2008, the result of the above-mentioned Indian River Power Plant disposal.
 - Reports of all mercury released to air fell by an additional 19 pounds following a 92-pound decrease for 2007.

In summary, total on-site releases are down. On-site releases are down for air and water, but up for land. Additional detail regarding the changes noted above, as well as discussion related to specific facilities can be found in the facility profiles starting on page 17 of this report.

Introduction

What is the Toxics Release Inventory?

The Toxics Release Inventory, or TRI, is a publicly available data set containing information reported annually for toxic chemicals manufactured, processed, or otherwise used by certain facilities in Delaware and throughout the United States. Annually, these facilities report releases and waste management information for covered chemicals. The reportable list of toxic chemicals for 2008 included 581 individual chemicals and 30 chemical categories. TRI was established in 1986 under Title III, Section 313, of the Federal Superfund Amendments and Reauthorization Act (SARA 313) to provide information to the public about the presence and release of toxic chemicals in their communities. Title III is also known as the Emergency Planning and Community Right-to-Know Act (EPCRA). See Appendix A for more information. Covered facilities report TRI information to the U.S. Environmental Protection Agency (EPA) and to the state in which the facility is located. In Delaware, the EPCRA Reporting Program within the Department of Natural Resources and Environmental Control (DNREC) receives and compiles TRI data from facilities located within the State. The EPCRA Reporting Program maintains a database that is updated as new reports and revisions to old reports are received. The database currently contains 22 years of reported data. Most releases reported under TRI are also regulated through Federal and/or State permits.

This report contains detail from every 2008 TRI report and report revision from Delaware facilities filed with and received by DNREC as of November 1, 2008. Facilities must submit these reports to DNREC and EPA by July 1 of each year. Several types of analyses are presented in this report based on this data and data from prior years.

A second, less detailed report that provides a summary of the data presented here is also available. See **[Access to TRI Files](#)** on page 59 for details.

Reporting Requirements

A facility is required to submit a report for a listed toxic chemical if the facility meets all of the following criteria:

1. Employs the equivalent of 10 or more full-time employees,
2. Is a covered industry, or is a Federal facility (See Table 1 on the next page for a list of reporting industries), and,
3. Manufactures or processes more than 25,000 pounds, or otherwise uses more than 10,000 pounds, of the listed toxic chemical during the course of the calendar year. Limits for specific chemicals known as PBTs (Persistent Bioaccumulative Toxics) are lower (see Table 7 on page 38).

Note that from time to time, the EPA proposes changes in reporting requirements. It gives agencies, reporting facilities, and other interested parties time to comment on these changes prior to making a final decision about the proposed change. See page 5 for more details. Facilities that meet the criteria for reporting must submit one report for each listed toxic chemical manufactured, processed, or otherwise used above threshold quantities. The reports cover activities during the previous calendar year.

It is important to note that a facility may need to report even if it has no releases of toxic chemicals, because reporting is based on the amount manufactured, processed, or otherwise used, and not the amount released.

Table 1 provides a list of covered industries reporting to the Delaware TRI program for 2008 along with the corresponding three primary digits of the North American Industrial Classification System (NAICS) Codes. NAICS 6-digit codes are used to identify the type of activities performed at a facility. Each industry sector represented by facilities reporting in Delaware for 2008 is described in Table 5 on page 16. The NAICS codes were used in TRI starting in 2006 to provide more discrimination between the various industry sectors reporting to TRI. They do not correspond directly to the Standard Industrial Classification (SIC) 4-digit codes that were in use since the beginning of the program. Because of the diversity of industries reporting to TRI and the differences in code definitions, all the facilities that were in a particular SIC code may not remain together in a NAICS code.

**TABLE 1
COVERED INDUSTRIES**

NAICS CODES	INDUSTRY
212	Mining
221	Utilities
311	Food Manufacturing
313	Textile Products Mfg.
324	Petroleum and Coal Products Mfg.
325	Chemical Manufacturing
326	Plastics and Rubber Manufacturing
331	Primary Metal Manufacturing
332	Fabricated Metal product Mfg.
334	Computer and Electronic Product Mfg.
335	Electrical Equipment Mfg.
336	Transportation Equipment Mfg.
337	Furniture Manufacturing
339	Misc. Manufacturing
424	Wholesalers, Non-Durable Goods
454	Non-Store Retailers
928	National Security

The standard Form R report (see Appendix M for Form) contains general facility information and data about on-site releases, off-site transfers, and on-site waste management activities. In lieu of Form R, the optional short form (Form A, Appendix N) may be used, provided certain criteria are met. Form A, initiated in the 1997 reporting year, is a two-page report that provides facility information (essentially the same as Form R) and identification of the chemical, but does not provide any release, transfer, or waste management data. Nationwide, 14% of the TRI reports were filed as Form A, but in Delaware only 10% were filed as Form A. After a facility determines that it must report on a given chemical, the facility is eligible to use Form A if:

For Persistent Bioaccumulative Toxic (PBT) Chemicals including dioxins:

- PBTs, including Dioxins and dioxin-like compounds may not be reported on Form A. Starting in 2008, an additional form, Schedule 1, is also required for dioxins.**

For reporting years 2006-2007, limited reporting of non-dioxin PBTs which had no releases was allowed, but that provision was revoked for 2008 and PBT reporting was returned to the 2005 and earlier years' requirements.

For non-PBT chemicals:

1. The total annual reportable amount (including the sum of on- and off-site releases, disposal, treatment, recovery for recycle or energy) is less than 500 pounds, and
2. The total annual amount of the chemical manufactured, processed, or otherwise used does not exceed 1,000,000 pounds.

Because of the lack of data in the Form A reports, DNREC has been working with the reporting facilities to emphasize the importance of reporting on Form R. Delaware had a decrease of eight Form A reports for 2006, one for 2007, and 13 for 2008.

Limitations of TRI Data

The user of TRI data should be aware of its limitations in order to interpret its significance accurately.

- **NOT ALL FACILITIES ARE REQUIRED TO REPORT.** A relatively small number of facilities in Delaware are required to report under TRI, based on the criteria listed on pages 2-4. TRI facilities are primarily industrial/manufacturing facilities and facilities report releases and other waste management activity to TRI. TRI does not account for amounts of hazardous material stored at facilities. The DNREC program addressing inventories of material stored on site, the Hazardous Chemical Reporting program known as "Tier II" (also administered under EPCRA), includes a much greater number of facilities. Facilities report amounts and the location of chemicals stored on-site to Tier II, but not releases. For further information, see ***Hazardous Chemical Reporting*** in Appendix A.
- **OTHER SOURCES NOT COVERED UNDER TRI ALSO RELEASE TOXIC CHEMICALS.** Other significant sources of pollution include small businesses, motor vehicles, and agricultural operations, as examples. For some chemicals, their use as consumer products is a significant source of releases.
- **FACILITIES ARE REQUIRED TO BASE TRI DATA ON MEASUREMENTS AND MONITORING DATA IF THESE ARE AVAILABLE AT THE FACILITY.** If such data is not available, quantities may be estimated based on published emission factors, mass balance calculations, or good engineering judgment. Additional monitoring equipment and measurements are not required. For 2008, 10% of the reports representing 36% of reported on-site release amounts were estimated using monitoring data, with the balance being split between emission factors, mass balance calculations, and other methods.
- **THE DATA ESTIMATION METHODS MAY CHANGE OR VARY.** The methods of estimating, analytical methodology, or basis of calculating data used by different facilities, or even the same facility over time, may vary, and may result in significant changes in reporting while the actual release may remain relatively unchanged. DNREC performs cross-checks of the data with other information sources to verify its accuracy and contacts facilities concerning apparent discrepancies.
- **REVISIONS TO FORM R DATA MAY OCCUR AT ANY TIME.** These revisions sometimes involve significant changes for data previously reported by a facility.
- **THE DATA DOES NOT INDICATE AMOUNT OF HUMAN EXPOSURE.** An important consideration to keep in mind is that TRI does not provide an indication of potential exposure to the reported releases and cannot be used by itself to determine the impact on public health. The chemical's release rate, toxicity, and environmental fate, as well as

local weather and wind direction and the proximity of nearby communities to the release must be considered when assessing exposures. Small releases of highly toxic chemicals may pose greater risks than large releases of less toxic chemicals. The potential for exposure increases the longer the chemical remains unchanged in the environment.

Some chemicals may quickly break down into less toxic forms, while others may accumulate in the environment, becoming a potential source of long-term exposure. The chemical exposure of a population depends on the environmental media (air, water, land) into which the chemical is released. The media also affects the type of exposure possible, such as inhalation, dermal exposure, or ingestion.

Despite these limitations, TRI serves as a valuable screening tool to identify areas of concern that may require further investigation.

Recent Developments in TRI Reporting

The TRI reporting requirements change as EPA seeks to improve the program through changes to the list of reportable chemicals and through program expansions. Because of these changes, considerable caution must be exercised when comparing TRI data from previous years. Some of the data presented later in this report will be adjusted for changes that have been made in order to present the data on a more constant reporting basis from year to year. Notations will be made to indicate which data is presented with these adjustments.

- **Chemical List Changes**

For reporting year 1995 and beyond, EPA significantly expanded the list of chemicals. For reporting year 2000 and beyond EPA established substantially lower reporting thresholds for 15 chemicals and 2 chemical categories that are highly persistent and bioaccumulative in the environment (PBTs). See page 38 for details on these reports.

- **Industry Expansion**

Beginning with the 1998 reporting year, EPA added seven industries to the list of facilities covered under TRI. Prior to the 1998 reporting year, only manufacturers (SIC codes 2000-3999) and Federal facilities were required to report (See Table 1 on page 3). The greatest impact to Delaware is the Electric Utilities (NAICS 221). The industry expansion significantly increased the amount of reported releases. This did not necessarily represent an increase in toxic releases in Delaware, but rather provided additional information to the public.

- **SIC/NAICS**

Starting in the 2006 reporting year, four-digit facility SIC (Standard Industrial Classification) codes were phased out and replaced with six-digit NAICS (North American Industry Classification System) codes. Facilities should not have been added or removed from TRI reporting because of this change. See page 3 for a listing of the primary NAICS codes reported to the Delaware TRI program for 2008, and additional discussion about NAICS, and page 16 for data reported by NAICS code.

- **Dioxin and Dioxin-Like Compounds for the 2008 Reporting Year**

There are seventeen distinct members of this chemical category listed under TRI. On May 10, 2008, the EPA Toxics Release Inventory Program issued a final rule expanding reporting requirements for the dioxin and dioxin-like compounds category. The final rule

requires that, in addition to the total grams released for the entire category, facilities must report the quantity for each individual member on a new Form. The reporting requirements of the final rule apply to the 2008 reporting year beginning January 1, 2008, (for which reports are due July 1, 2009), and to subsequent reporting years. EPA and DNREC will then use the individual mass quantity data to calculate Toxic Equivalent Quantity (TEQ) values that will be made available to the public along with the mass data. This data for Delaware facilities is presented in this report starting on page 40.

2008 Data Summary

TABLE 2
2008 TRI DATA SUMMARY
(IN POUNDS)

	2008
Number of Facilities	68
Number of Form As	31
Number of Form Rs	287
Number of Chemicals	100
On-site Releases	
Air	5,771,173
Water	2,796,686
Land	885,976
Total On-Site Releases	9,453,836
Off-Site Transfers	
POTWs	1,117,335
Recycle	7,535,327
Energy Recovery	3,707,411
Treatment	150,297
Disposal	3,129,281
Total Off-Site Transfers	15,639,650
On-Site Waste Mgmt.	
Recycle	10,870,477
Energy Recovery	20,932,200
Treatment	42,281,742
Total On-Site Mgmt.	74,084,419
Total Waste	99,177,905

Statewide totals of reported 2008 TRI on-site releases, off-site transfers, and wastes managed on-site are shown in Table 2. On-site releases were lower by 11.3% (1,200,000 pounds) compared to 2007. Hydrochloric Acid accounted for 721,000 pounds of the decrease, and nitrate compounds accounted for another 381,000 pounds. Changes in raw materials, pollution controls, and production levels at many facilities accounted for both decreases and increases. A total of 68 facilities submitted 318 reports on 100 different chemicals. Twenty fewer reports were submitted and two less chemicals were reported on for 2008. Of the 318 reports, 31 were submitted using Form A. Polycyclic aromatic compounds, lead compounds, Ammonia, methanol, and benzo (g,h,i) perylene all had greater than 10 reports. Releases to air, led by acid gases, constitute the largest portion of the total on-site releases. Hydrochloric acid aerosols released to air made up the largest decrease.

Types of Data

Table 2 lists all the categories of data reported to Delaware and EPA under the TRI program. Within the reports received from facilities, the

data is broken down into additional sub-categories. For ease of presentation in this report, the data has been grouped into these categories as described below.

On-Site Releases: There are four categories, but one of these, **underground injection** of TRI chemical waste to wells, is not permitted in Delaware. On-site releases in Delaware are to **air**, **water**, or **land**. The **release to air** category includes stack releases collected by mechanical means such as vents, ducts, or pipes, and fugitive releases escaping collection, including equipment leaks and evaporation, and is released into the general atmosphere. **Releases to water** are to water bodies, including streams, rivers, lakes, bays, or oceans. This includes releases from contained sources, such as industrial process outflow or open trenches.

Releases to water which contain TRI-reportable chemicals in runoff and storm water runoff are also reportable. **Releases to land** are to (1) RCRA (Resource Conservation and Recovery Act) landfills, in which wastes are buried, (2) surface impoundments, which are uncovered holding areas used to volatilize and/or settle waste materials, (3) other land disposal such as waste piles or releases to land such as spills or leaks, (4) land application/treatment in which waste containing a listed chemical is applied to or incorporated into soil, and (5) other non-RCRA landfills.

Off-site Transfers: Off-site transfers include transfer of chemical waste to **POTWs** (publicly owned wastewater treatment plants), **recycle** operations (5 types), **energy recovery** operations (2 types), **treatment** operations (6 types), and **disposal** (14 types). The receiving facilities are separate from the facility generating the waste. This total of 27 sub-categories is provided for the purpose of classifying the types of final off-site waste management undertaken for each chemical.

On-site Waste Management: Waste management operations at the facility generating the waste are categorized to include **recycle**, **energy recovery**, and **treatment**.

On-Site Releases

On-site TRI releases are emissions from a facility to the environment because of normal operations, including emissions to the air, discharges to surface water, disposal onto or into the ground, and under-ground injection. Under-ground injection is not an approved method of TRI or hazardous waste disposal in Delaware, and thus has not been reported by any facility in Delaware since TRI reporting began. Total on-site releases to air, water, and land reported to TRI in 2008 made up 10% of all TRI-reported waste amounts.

**FIGURE 1
2008 ON SITE RELEASES**

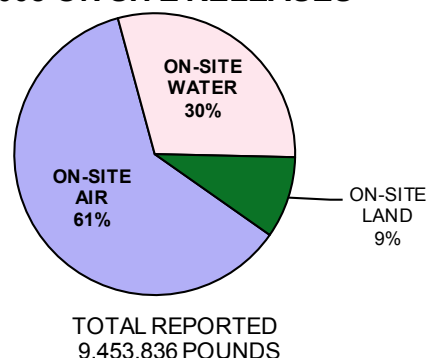
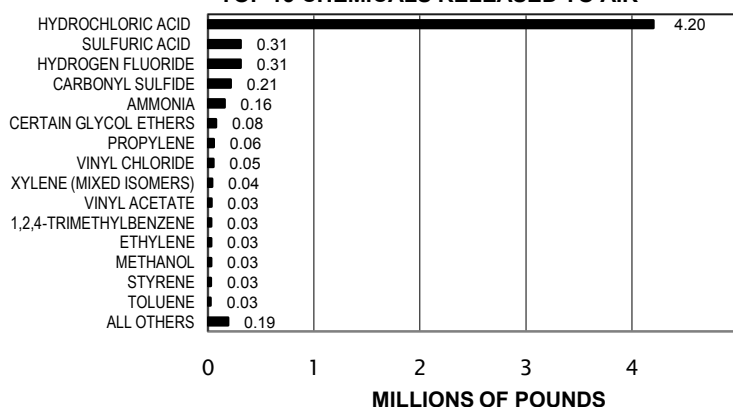


Figure 1 shows the totals of on-site releases reported in the State. A large portion, 61% of the total on-site release, is to air. Additional analysis of on-site releases is presented in Figures 2, 3, and 4, which show the top 15 chemicals released to air, water, and land. Additional detail about on-site releases can be found in Appendices C, E, F, and H.

Releases to Air

Figure 2 provides an illustration of the relative release of the top 15 chemicals compared to all other 71 chemicals reported as released in 2008 to the air. The remaining 14 chemicals had no releases to air. As in all the years following the inclusion of the power generating facilities, acid gases top the list.

**FIGURE 2
TOP 15 CHEMICALS RELEASED TO AIR**



Specifically, hydrochloric and sulfuric acid aerosols (gases) and hydrogen fluoride are released from power generating facilities located in all three counties. These three chemicals comprise 84% of all Delaware-reported TRI on-site releases to air. Two facilities reported carbonyl sulfide, which accounted for 3.7% of all releases to air. DuPont Edge Moor was the primary reporter of this chemical. Carbonyl sulfide is a gas by-product of the titanium dioxide production process. Eleven facilities reported ammonia, which accounted for 2.7% of all on-site releases to air. Ammonia is released from petrochemical, food processing, and chemical facilities and is a by-product of air pollution control activities, primarily at electric generating facilities. Certain glycol ethers and xylene are primarily used as solvents in paints for the automobile manufacturing industry. The Chrysler and General Motors automobile assembly facilities accounted for most of these releases. Six facilities reported on certain glycol ethers (1.3% of on-site releases to air). Eight facilities reported xylene, (0.7% of total on-site releases to air). The Premcor refinery, the only reporter of propylene, reported a significant increase in this release to air for 2007 as the refinery began to use new data to estimate the release amount from its Frozen Earth Storage system. Propylene accounted for 1.0% of all on-site releases to air for 2008. Vinyl chloride is used in the manufacture of polyvinylchloride (PVC). One facility, Formosa Plastics, reported on vinyl chloride, which accounted for 0.9% of all releases to on-site air. Formosa Plastics also reported 98% of the releases for vinyl acetate, which made up 0.51% of the releases to on-site air. The remaining chemicals released to air were each less than 0.52% of total releases to air.

Releases to Water

As can be seen in Figure 1 on page 7, releases to water were lower than releases to air. On-site releases to water made up 30% of the total on-site releases compared to 61% for air.

TABLE 3
TRI CHEMICALS RELEASED TO WATER BY WATERSHED

WATER BODY	NO. OF FACILITIES	NO. OF REPORTS	RELEASE (IN POUNDS)
DELAWARE RIVER	7	66	2,216,160
DRAWYER CREEK TRIBUTARY	1	2	22
ISLAND CREEK	1	9	2,760
MCKEE RUN	1	3	0
MUDDY RUN	1	2	0
NAAMANS CREEK	1	6	279
NANTICOKE RIVER	1	8	250,140
RED LION CREEK	0	0	0
SANDY BRANCH	0	0	0
SAVANNAH DITCH	1	2	327,325
STATE TOTAL	14	98	2,796,686

FIGURE 3
TOP 15 CHEMICALS RELEASED TO WATER

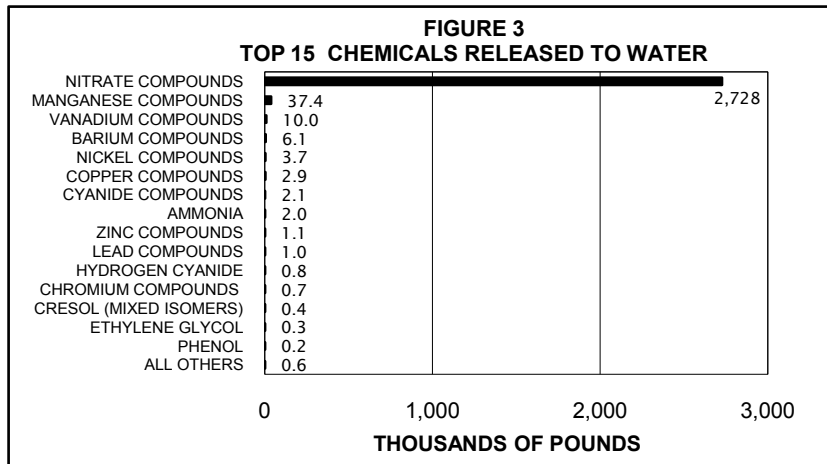


Table 3 shows the amount of TRI chemicals released to each water body that received a TRI chemical. Figure 3 below shows the relative relationship of the top 15 TRI chemicals to all other chemicals (27) reported as released to water. This clearly shows the influence that nitrate compounds have on the total. Premcor, the Edge Moor/Hay Road power plant, Perdue Georgetown, and INVISTA reported a total decrease of 540,600 pounds of nitrate compounds released to water. These were part of the releases to the Delaware River and the Nanticoke River. More details of these releases can be found in the facility profiles on pages 19, 20, 21, and 22. Figure 3 shows that nitrate compounds

were the top chemical released, (98% of the total release to water), followed by manganese compounds (1.3%) and vanadium compounds (0.36%). The remaining chemicals released to water were each less than 0.30% of the total releases to water. The biological treatment of nitrogen-containing materials such as ammonia and animal waste is responsible for the formation of nitrate compounds. Premcor reported 2,150,000 pounds of nitrate compounds released to water. Premcor changed its sampling method for 2006 by taking more frequent samples during normal periods of operation. This change led to the discovery that the previous method was not as accurate, so the new, more accurate amounts were reported. In 2007, the frequency was increased again to provide additional accuracy. Perdue Georgetown was the second largest reporter of nitrate compounds releases at 327,000 pounds, and INVISTA reported 250,000 pounds. Manganese and vanadium compounds are products of petroleum refining, coal and oil combustion, and ore processing. Manganese compounds were released to water primarily by DuPont Edge Moor and the Premcor refinery. DuPont reported 87% of the manganese compounds released to water. Vanadium compounds were released to water largely (99%) by the Premcor refinery. Metallic (antimony, barium, cobalt, chromium, copper, lead, manganese, mercury, nickel, vanadium, zinc) compounds are generally products of fuel combustion and ore refining. The DuPont Edge Moor, Edge Moor/Hay Road Power Plants, Indian River Power Plant, and the Premcor refinery are the primary facilities releasing these compounds to water. Ammonia is the by-product of pollution control activities and waste treatment. Premcor reported almost all of the ammonia releases to water.

Not every report to a water body in Table 3 shows a release quantity. For example, of the 66 reports listing the Delaware River as their destination or possible destination watershed, 60 reports show an actual release quantity to the Delaware River. The other 6 met the TRI reporting requirements and had the potential to release to the river and may have released chemicals to other media (air or land), but did not report any amounts actually released to the river. In Delaware, 22 of the 105 reports listing a water body as a possible destination for a release to water did not report any quantities actually released to that water body.

Table 4 shows the total amount of TRI chemicals for 2008 released to each basin in the State of Delaware. The Inland Bays include lands that drain into the Indian River Bay/ Rehoboth Bay area, then to the Atlantic Ocean. The Piedmont Basin contains lands that drain into the portion of the Delaware River above the City of New Castle. All the receiving streams except the Nanticoke River eventually feed into the Delaware Bay. The

TABLE 4
TRI CHEMICALS
RELEASED TO WATER BY BASIN

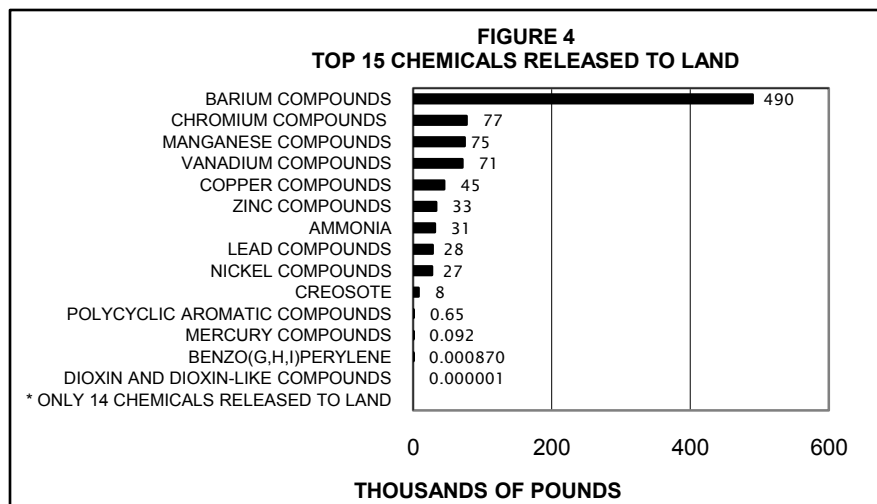
BASIN	RELEASE (IN POUNDS)	PERCENT
CHESAPEAKE	250,140	8.9%
DELAWARE BAY	2,500,425	89.4%
INLAND BAYS	2,760	0.1%
PIEDMONT	43,361	1.6%
STATE TOTAL	2,796,686	100.0%

total amount released to water decreased by 531,000 pounds in 2008, largely the result of decreases in the reported release of nitrate compounds reported by Premcor, INVISTA, and Perdue Georgetown. Additional discussion about these releases can be found in the Trend Analysis Section starting on page 47 and in the facility profiles starting on page 18.

Releases to Land

Releases to land, as shown in Figure 1 on page 7, are relatively small, amounting to 9% of total on-site releases. Figure 4 on page 10 shows the relative contribution for all 14 chemicals reported as being released to land. Nearly all the releases to land are metals and metal

compounds except for the relatively small quantities of ammonia, creosote, PACs, benzo (g,h,i) perylene (0.00087 pounds), and dioxin/dioxin-like compounds (0.000001 pounds). Most of the metals and metal compounds reported are formed during combustion or refining processes from metal impurities that exist in coal or oil.



Barium compounds now comprise 55% of the total releases to land, and all metallic compounds compose 95.5% of all releases to land. Releases to on-site land by the Indian River Power Plant of the metallic compounds (antimony, lead, barium, cobalt, nickel, copper, chromium, manganese, mercury, vanadium, and zinc) shown in Figure 4 account for 95.3% of the

total releases to land. Additional discussion about these releases to land and their trends can be found in the Trend Analysis Section starting on page 47.

Descriptions about some of the hazards these chemicals released to air, water, and land may present can be found in Appendix K.

Off-Site Transfers

Off-site transfers are material transfers to off-site locations for the purpose of disposal, recycling, energy recovery, or treatment. Treatment could be at a private waste treatment facility or at a publicly owned treatment works (POTW), typically a municipal wastewater treatment plant. The amounts of chemical wastes transferred off-site, although lower by 28% since 2007, are more than 1.5 times the amounts released on-site.

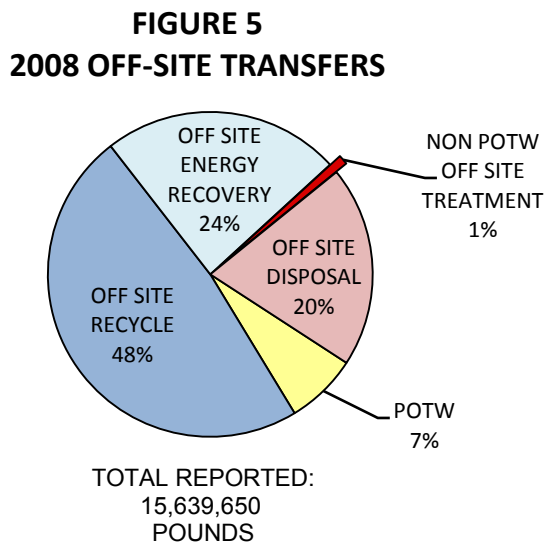


Figure 5 shows the relative portions transferred to the five off-site transfer categories. Table 2 on page 6 shows these amounts in tabular form, and Appendices D and G provide additional detail for transfers from each facility.

TRI chemicals in wastes are transported by various means from Delaware to their final destinations, many of which are out-of-state. TRI chemicals were sent to 18 states,

some as far away as Wisconsin and Texas and also to Canada and Sri Lanka, in addition to locations in Delaware. Over 90% of TRI chemicals in all wastes and over 97% of non-POTW wastes transferred off-site were sent to out-of-state locations for further processing and/or disposal. Over 99% of POTW wastes generated by Delaware facilities are treated in-state.

While on-site releases account for 10% of total TRI waste, reported off-site transfers account for 16% of the total TRI wastes. See Figure 5 on page 10 for detail about how these wastes are managed. Off-site transfer to recycle operations accounted for 48% of the amounts within the five categories in off-site transfers, energy recovery accounted for 24%, and disposals accounted for 20% of the transfers. Seventy-nine percent of the transfers to POTWs were to the City of Wilmington POTW, and all but 7,126 pounds of the 1,117,335 pounds treated at all POTWs were treated at Delaware POTW facilities. Ciba, Rohm & Haas, and Chrysler combined for 90% of the total TRI transfers to the Wilmington POTW.

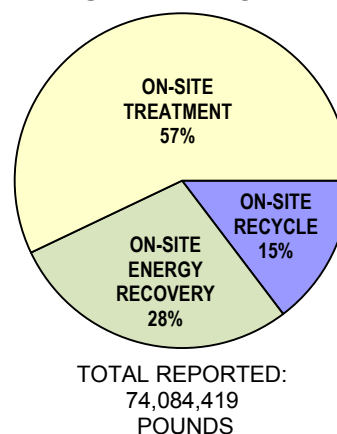
See page 52 for more information on Delaware facilities receiving TRI chemicals from other Delaware TRI facilities and from out-of-state TRI facilities.

On-Site Waste Management

On-Site Waste Management is the amount of waste that never leaves the facility site and is managed by the facility on-site. The categories of **Recycle**, **Energy Recovery**, and **Treatment** are used to define on-site management activities related to TRI chemical wastes. The total amount of TRI chemicals managed on-site is 75% of the total TRI chemical waste.

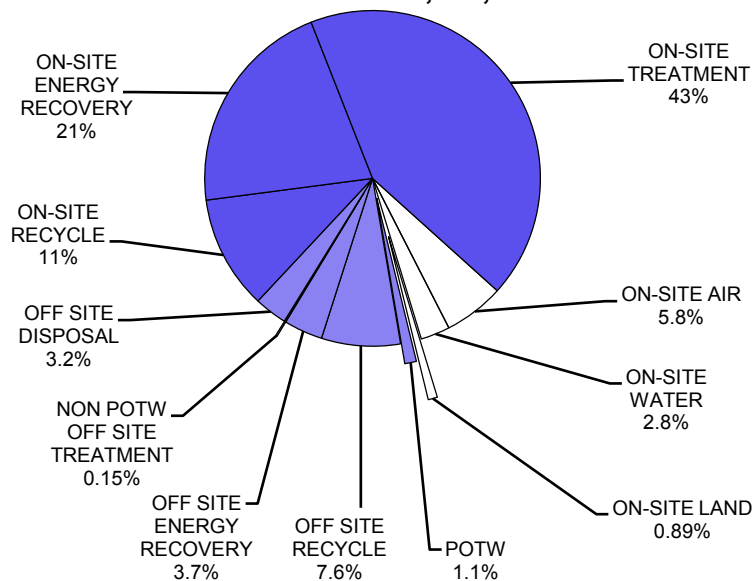
This amount is over seven times the amount of on-site releases. Figure 6 shows the portions of these wastes processed on-site. Appendices D and G provide additional detail about management of this chemical waste. **Recycled** waste is the quantity of the toxic material recovered at the facility and made available for further use. **Energy Recovery** includes the quantity of toxic material that had heat value and was combusted in some form of energy recovery device such as a furnace. The **Waste Treatment** segment includes the amount of toxic material that was destroyed in on-site waste treatment operations. Premcor, DuPont Edge Moor, Rohm & Haas, Medal, Dow Reichhold, and the Indian River Power Plant have the highest total amounts of on-site waste management.

**FIGURE 6
2008 ON SITE
WASTE MANAGEMENT**



Total Waste

FIGURE 7
TOTAL 2008 TRI CHEMICAL MANAGEMENT
TOTAL REPORTED: 99,177,905 POUNDS



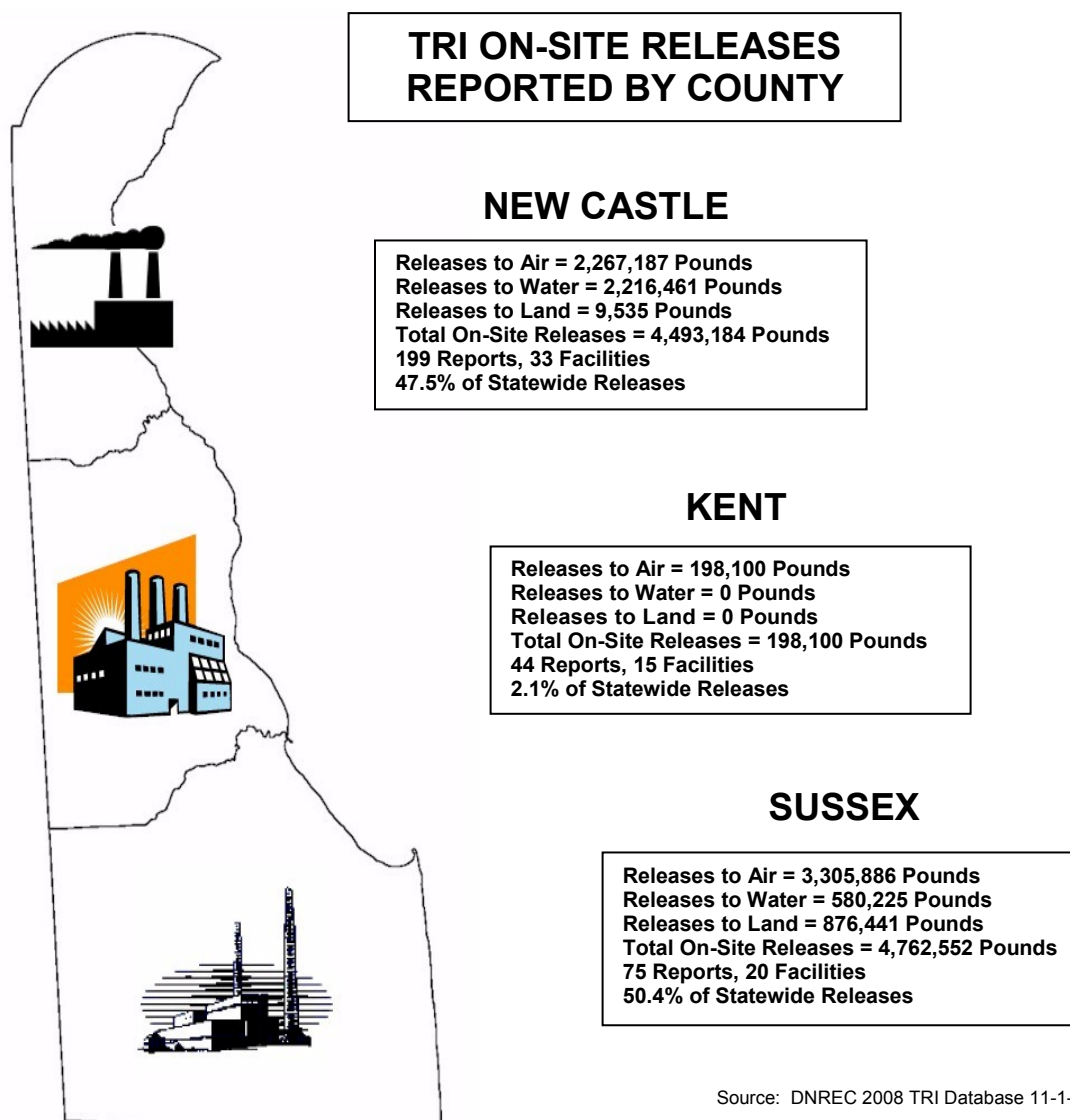
Total waste is the combined total of the on-site release, off-site transfer, and on-site waste management portions of the TRI chemical report. Figure 7 provides a perspective of the total TRI chemical waste picture in Delaware. About 9.5% of the total reported TRI waste is released on-site, 15.8% is transferred off-site for treatment or disposal, and 74.7% is managed on-site through treatment, energy recovery, and recycling operations by the facilities generating the waste. Figure 7 shows the relative portions of each major and sub-segment of TRI waste management.

2008 Data Detail

On-Site Releases by County

Figure 8 below provides basic on-site release information for each county in the State.

FIGURE 8

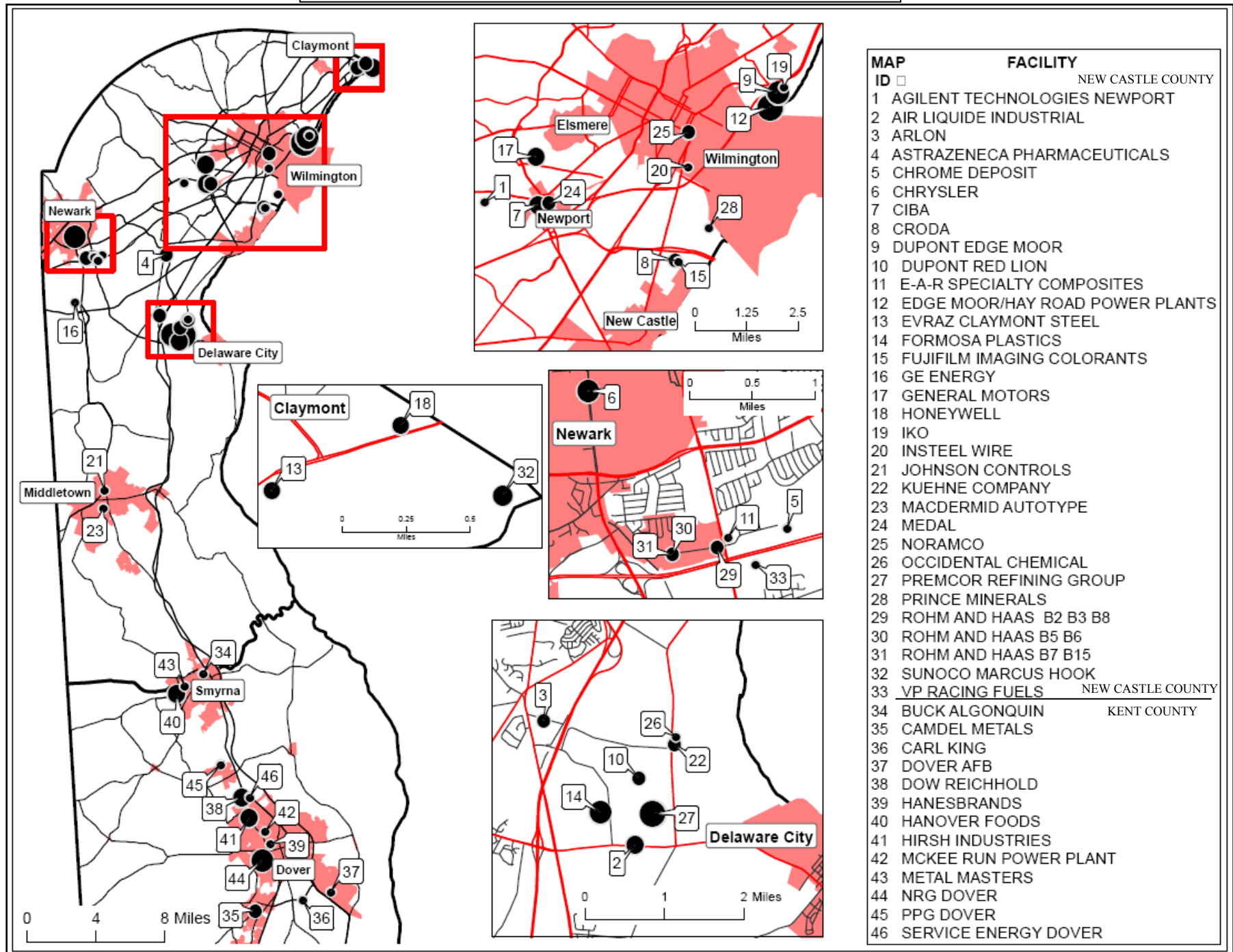


Source: DNREC 2008 TRI Database 11-1-09

Facility Locations

Figure 9 on the following two pages provides the location of each reporting facility in the State. The size of the facility location marker depicts the size of its on-site release relative to other facilities in the State. Facility contact information is in Appendix B.

FIGURE 9 TRI FACILITY LOCATOR MAP



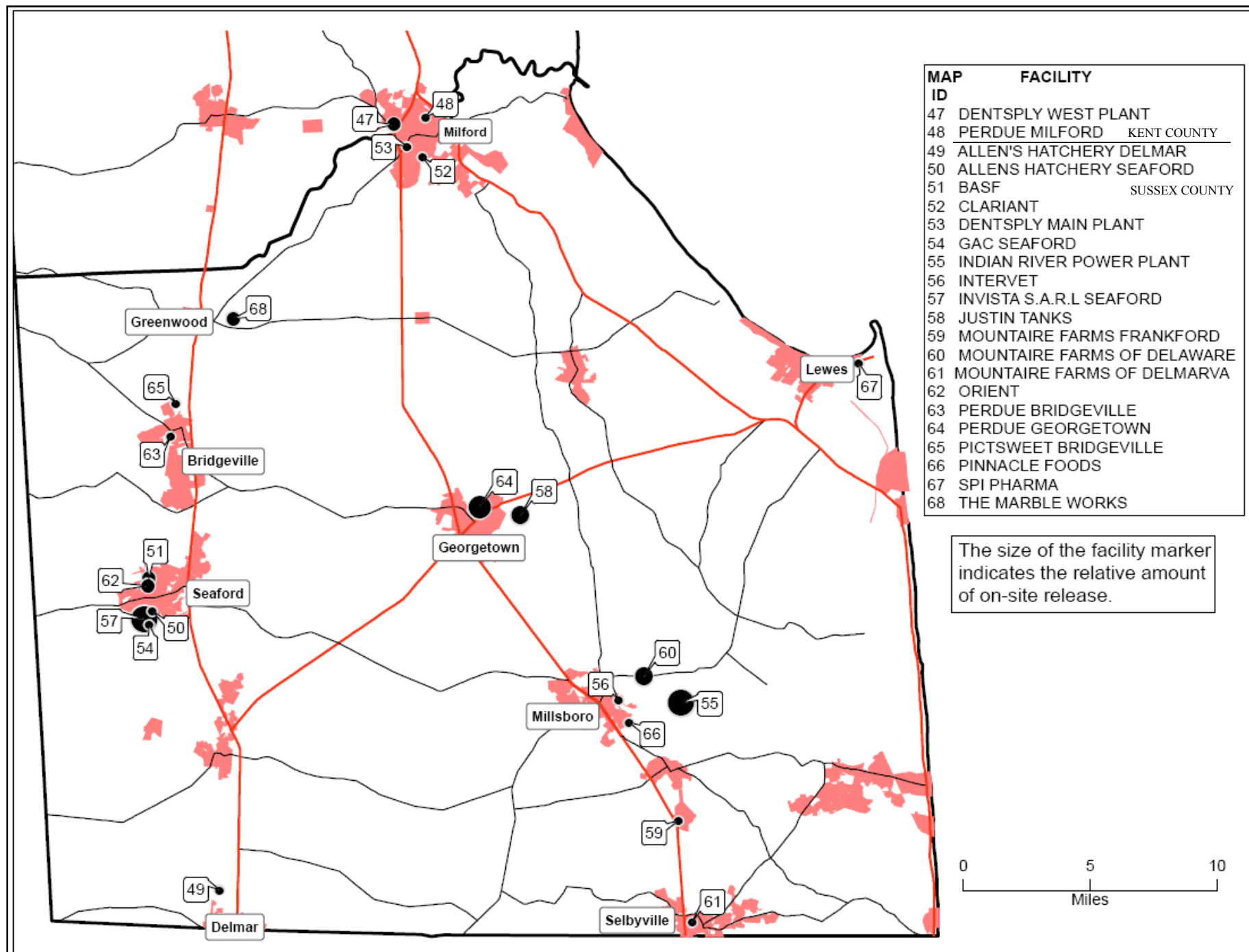


FIGURE 9 TRI FACILITY LOCATOR MAP

NAICS Industry Groups

Table 5 provides a description of each North American Industrial Classification System (NAICS) industry group and the number of facilities in each group that reported in Delaware, along with the total reported amounts for each NAICS code. Starting with the 2006 reporting year, NAICS codes replaced the SIC (Standard Industrial Classification) codes. This table also provides on-site releases, off-site transfers, and wastes managed on-site for each group.

TABLE 5
2008 TRI DATA BY PRIMARY NAICS GROUP
(in pounds)

NAICS CODE	INDUSTRY GROUP	OF REPORTS	OF FACILITIES	FORM A	FORM R	ON-SITE RELEASE	OFF SITE TRANSFERS	WASTE MGMT.
212	Mining	4	1	0	4	301	0	0
221	Utilities	42	4	1	41	5,325,282	284,124	3,081,197
311	Food Manufacturing	32	11	16	16	371,897	0	95,833
313	Textile Products Mfg.	5	2	0	5	4,166	908,674	4,881,772
324	Petroleum & Coal Products Mfg.	55	5	4	51	2,464,567	135,851	41,023,232
325	Chemical Manufacturing	113	24	5	108	1,047,973	7,844,993	20,295,641
326	Plastics & Rubber Mfg.	10	5	0	10	30,198	244,125	4,611,689
331	Primary Metal Manufacturing	13	3	0	13	12,653	2,766,757	0
332	Fabricated Metal product Mfg.	4	3	0	4	6	302,200	0
333	Equipment Mfg.	0	0	0	0	0	0	0
334	Computer and Electronic Product Mfg.	2	1	0	2	0	2,821	0
335	Electrical Equipment Mfg.	2	1	0	2	190	2,935,231	0
336	Transportation Equipment Mfg.	23	2	0	23	179,806	170,010	95,055
337	Furniture Manufacturing	1	1	0	1	13,048	0	0
339	Misc. Manufacturing	4	2	0	4	3,413	44,864	0
424	Wholesalers, Non-Durable Goods	2	1	2	0	0	0	0
454	Non-Store Retailers	3	1	3	0	0	0	0
928	National Security	3	1	0	3	337	0	0
TOTAL		318	68	31	287	9,453,836	15,639,650	74,084,419

FIGURE 10
TOP 5 NAICS INDUSTRIES FOR 2008
PERCENT ON-SITE RELEASE

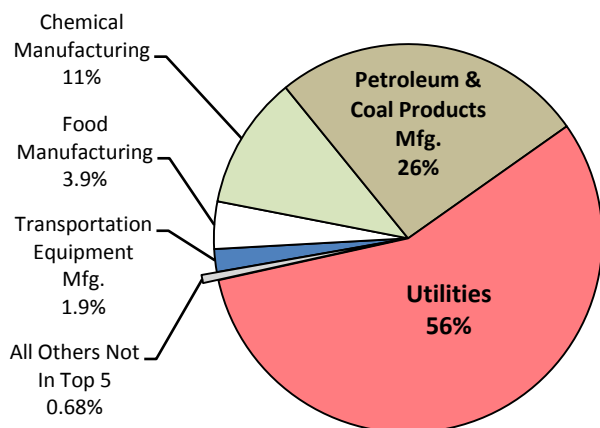


Figure 10 shows the percent contribution of each of the top five NAICS groups and all others not in the top five compared to the reported total on-site releases. Three of these top five, NAICS groups 221 (Utilities), 324 (Petroleum and Coal Products Mfg.) and 325 (Chemical Mfg.), combine for 93.5% of the total on-site releases within the State. Facilities not in the top five NAICS industry groups reported contributions of only 64,310 pounds on-site, or 0.68% of the 2008 on-site release total.

RELEASES FROM THE TOP 15 FACILITIES

Figure 11 shows the relative contribution of each of the top 15 reporting facilities to on-site releases. The top four facilities are, or have as a significant portion of their facility, an energy generating operation. Of the 9,453,836 pounds that were reported as released on-site by all 68 facilities Statewide, the top 15 facilities accounted for 9,354,808 pounds, or 99.0% of the total on-site releases.

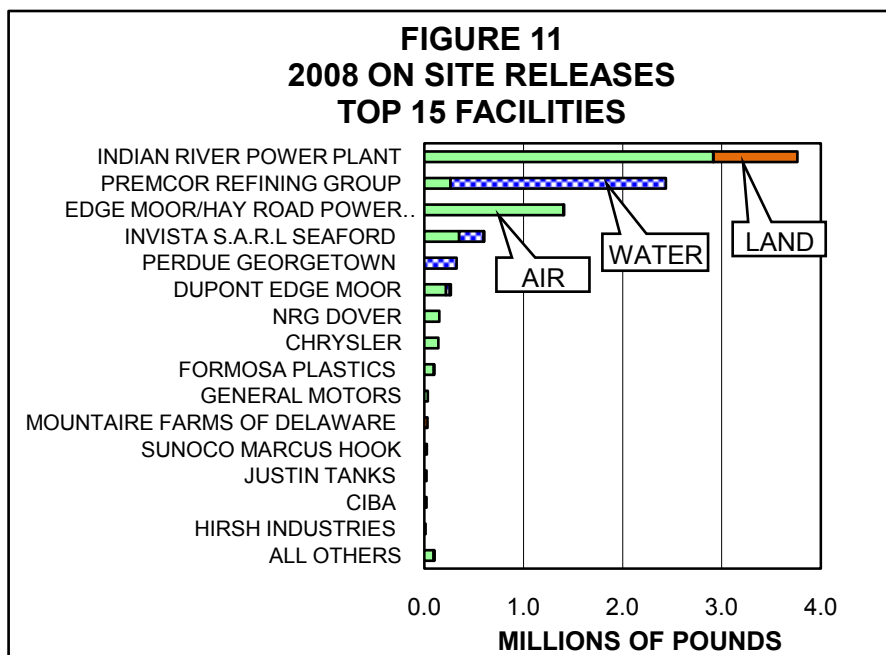


Table 6 shows the 2008 ranking of the top 15 facilities along with their 2007 ranking and the reported amounts of on-site releases for both years. Releases to the environment because of remedial actions, accidents, or one-time catastrophic events are included in these values. The percent change in total on-site releases for each of the top 15 facilities from 2007 to 2008 is also shown, and

**TABLE 6
TOP 15 FACILITIES 2007 AND 2008 RANKING BY ON SITE RELEASE
(in pounds)**

2008 RANK	FACILITY	2008			2008 ON-SITE RELEASE	2007 ON-SITE RELEASE	2007 TO 2008 CHANGE IN RELEASES	
		TOTAL AIR	TOTAL WATER	TOTAL LAND				
1	INDIAN RIVER POWER PLANT	2,917,366	2,760	844,150	3,764,276	3,664,155	100,121	3%
2	PREMCOR REFINING GROUP	264,858	2,173,069	-	2,437,927	2,902,499	(464,572)	-16%
3	EDGE MOOR/HAY ROAD POWER PLANTS	1,404,657	5,337	-	1,409,994	1,800,241	(390,247)	-22%
4	INVISTA S.A.R.L SEAFORD	352,111	250,140	1,100	603,351	764,094	(160,742)	-21%
5	PERDUE GEORGETOWN	152	327,325	-	327,477	489,916	(162,439)	-33%
6	DUPONT EDGE MOOR	221,012	37,638	8,662	267,312	242,106	25,206	10%
7	NRG DOVER	151,011	-	-	151,011	153,012	(2,000)	-1%
8	CHRYSLER	143,740	-	-	143,740	178,136	(34,396)	-19%
9	FORMOSA PLASTICS	95,730	4	-	95,734	79,632	16,102	20%
10	GENERAL MOTORS	36,066	-	-	36,066	160,023	(123,957)	-77%
11	MOUNTAIRE FARMS OF DELAWARE	1,644	-	31,191	32,835	2	32,833	>1000%
12	SUNOCO MARCUS HOOK	26,353	-	-	26,353	26,156	197	1%
13	JUSTIN TANKS	23,953	-	-	23,953	18,400	5,553	30%
14	CIBA	21,730	-	-	21,730	29,119	(7,389)	-25%
15	HIRSH INDUSTRIES	13,048	-	-	13,048	12,481	567	5%
	ALL OTHERS	97,741	414	873	99,028	117,535	(18,507)	-16%
	TOP 15	5,673,432	2,796,272	885,103	9,354,808	10,519,971	(1,165,164)	-11%
	STATE TOTALS, ALL FACILITIES	5,771,173	2,796,686	885,976	9,453,836	10,654,109	(1,200,273)	-11%

Source: 2007 and 2008 DNREC TRI Databases, November 2009

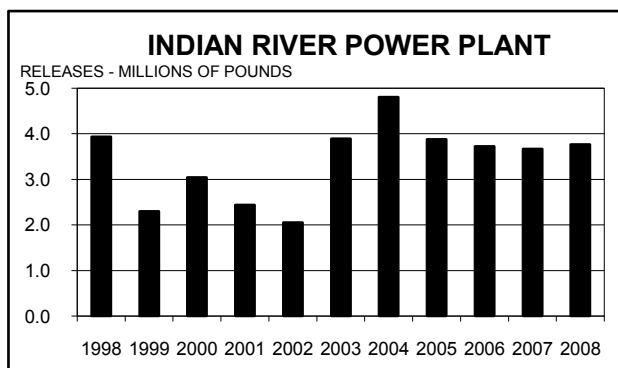
some of these changes are significant. Changes at the facility, such as the way releases are estimated, how waste is managed, changes in raw materials or processing methods, or installation of new or improved production equipment possibly used to limit or eliminate releases of all or specific chemicals, may affect reported releases. Changes in production amounts may or may not affect releases from a facility. Details for some of these changes are provided on the following pages. Interested individuals are also encouraged to contact facilities (see Appendix B for contact information) and inquire as to the reasons why changes occurred.

The next several pages present a brief description of each of the top 15 facilities to provide an understanding of the use and importance of some of the TRI chemicals and basic operations at these facilities. As in Table 6, this rank for the 2008 reporting year is based on total reported on-site releases. The facility description explains the general types of products manufactured at the facility and how their TRI chemicals relate to the products and the overall plant operation. The graph included with the facility description shows the trend of the facility total on-site releases since 1998, the date of the last major TRI reporting revision. The graph for each facility includes all chemicals, including the newly reportable chemicals, which have been reported by the facility. Comparisons must be made carefully as **the scales on each of the facility graphs are different**. Appendix C provides a complete list of 2008 on-site release data grouped by facility and chemical.

The DNREC TRI program visits select facilities statewide during the year to get a better understanding of operations at the facilities, discuss TRI issues such as data quality that may have developed in the course of reporting, and to introduce new facilities and/or facility coordinators to the TRI program and its reporting requirements. Seven visits were conducted during the 2008 reporting year.

Although the TRI program itself has no limits for emissions, other DNREC and Federal programs do issue permits and limit emissions from operating facilities.

Rank #1 – NRG Indian River Power Plant - This 784 megawatt facility, located near Millsboro, produces electricity, primarily from the combustion of coal. Oil- and coal-fired power plants were required to report under TRI for the first time for 1998. On-site releases at this facility increased by 3%, or 100,000 pounds, for 2008.



The Indian River Plant reported on seventeen TRI chemicals for 2008. Nine of these were metal compounds, three were non-metallic PBTs, three were acid gases, and the remaining two were ammonia and naphthalene. All the compounds except ammonia are formed during the combustion process as a result of impurities within the coal and oil. Ammonia is a product of the emissions reduction process.

Beginning in 2003, actual stack sample data (as compared to EPA emission factor methods) were used to calculate hydrochloric acid gas releases. These methods were applied to the entire year, and this resulted in significantly higher release amounts for hydrochloric acid gas from 2003 up to 2005. In 2005, coal analysis and emission factors were used to calculate the hydrochloric acid gas. This gave a more representative total release for the year because it represents all the data for the year, not just the data collected during a single stack test. Acid gasses, such as hydrochloric acid, sulfuric acid, and hydrofluoric acid, accounted for 75% of the facility's on-site releases in 2008.

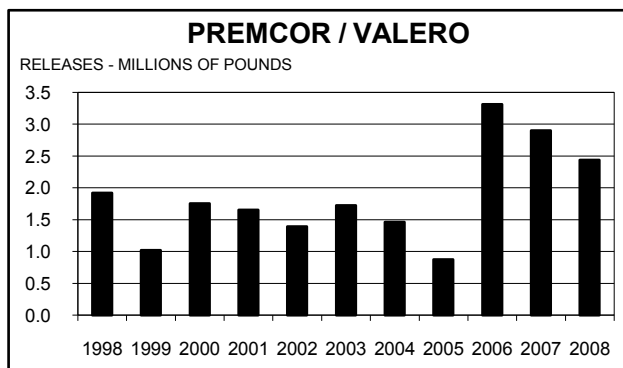
Coal analysis data, emissions data, and emissions factors are now used as a basis for calculating releases. Coal consumption increased 2.1% in 2007 and 2.3% in 2008 based on coal burn records. Indian River burned lower sulfur bituminous coal in 2007 and 2008, which contributed to lower TRI on-site release amounts of acid gasses. In 2008, reported releases of acid gasses decreased by 416,000 pounds (15%). Also in 2008, the disposal of ash containing metallic compounds captured from the emission control devices moved from off-site locations to the on-site landfill because of the lack of off-site beneficial use projects in which to participate. For 2008, total on-site release and off-site disposal of these metallic compounds increased by 34,700 pounds (4.2%). Metal compounds, formed as a result of impurities in the coal, are largely captured (99%) in the fly ash and bottom ash and sent to an on-site landfill or off-site beneficial use applications. For 2008, the total of on-site release and off-site disposal amounts for all TRI chemicals declined by 318,270 pounds compared to 2007.

Activated Carbon Injection on all units captures mercury from the flue gas. The mercury is bound to the carbon particles, collected, disposed of in the on-site landfill, and is reported as an on-site release. On-site mercury releases increased by 51 pounds (31%) for 2008 because the disposal of mercury was moved from off-site locations to the on-site landfill. The total of on-site releases and off-site disposal amounts were 214 pounds for 2008 compared to 216 pounds for 2007. On- and off-site release amounts of mercury have been reported in the range of 241-197 pounds for several years, down from 397 pounds reported for 2003. Starting in 2004, coal analysis data and emissions data were used to calculate mercury and other metal compound releases.

Ammonia is released in the power production process solely from the use of urea, a pollution control agent used in Selective Non-Catalytic Reduction (SNCR) technology for reducing NO_x by limiting the formation of oxides of nitrogen to the atmosphere. Ammonia release increased 63,000 pounds in 2008, the result from the addition of SNCR systems to Units 1 and 2 and increasing the operation of these systems from seasonal to annual operation.

Naphthalene is in the oil consumed at the facility.

Rank #2 – Premcor / Valero - The Valero Delaware City Refinery, owned and operated by The Premcor Refining Group Inc. (Premcor) refines crude oil into automobile gasoline, home heating oil, and a variety of other petroleum products. Premcor purchased the facility from Motiva Enterprises, L.L.C. on May 1, 2004, and subsequently became a subsidiary of Valero Energy Corporation. Premcor reported on 45 TRI chemicals for 2008. The total facility-reported on-site releases decreased by 464,600 pounds in 2008, primarily the result of a 202,500-pound reduction in sulfuric acid release to air, a 170,700-pound reduction in nitrate compounds release to water, and a 87,400-pound decrease in reported release of propylene to air. The facility will replace the propylene Frozen Earth Storage (FES) unit with another



storage unit and close the FES unit by December, 2010. For 2006, reported releases of nitrate compounds increased to 2,745,000 pounds, up from 234,000 pounds reported in 2005. This increase was based on new analytical data and an improved methodology for calculation of annual releases. The reported decrease in nitrate compounds for 2007 reflects the use of new analytical data for reporting year 2007, and this data continues to be used for 2008.

Reported release of propylene from the FES unit is based on new test methodology for quantifying fugitive emissions from this system, also starting for reporting year 2007. Sulfuric acid releases to air decreased by 202,500 pounds for 2008, primarily due to a decrease in the sulfur concentration in the fuel gas combusted, extended gasifier and combustion turbine downtime and reduced refinery throughput. On a historic basis, sulfuric acid releases have declined 80% since 2003, due primarily to the addition of wet gas scrubbers (WGS) at the Fluid Cat Cracker and Fluid Coker units. Release of Hydrochloric acid has decreased by over 99% since 2003, the result of installing a hydrochloric acid wet gas scrubber (WGS) on the Continuous Catalytic Reformer unit. Releases of MTBE continue to decline due to the phase-out of MTBE as an additive in gasoline. MTBE fell below the TRI reporting threshold in 2007 and was not reported for 2007 or 2008.

The above changes, along with other smaller increases and decreases, resulted in a net decrease of 464,600 pounds (16%) in reported on-site releases for the facility in 2008 compared to 2007.

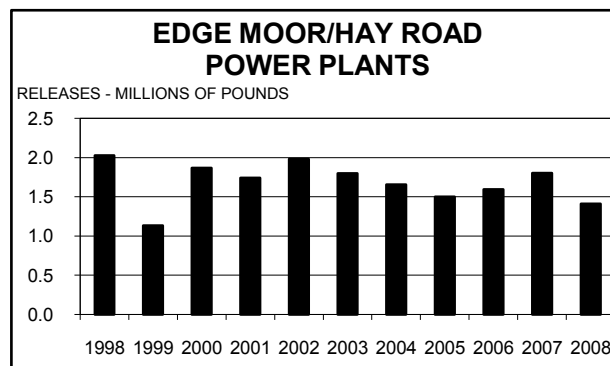
Total on-site waste management amounts increased by 4.28 million pounds in 2008. The majority of the increase is due to increases in amounts of carbonyl sulfide in the wet gas scrubber and ammonia in the stripper offgas stream treated for destruction in the Sulfur Recovery Unit. Also, increases were seen in cyanide compounds recovered for energy and treated for destruction in the Fluid Catalytic Cracking, Coking and Sulfur Recovery processes, and for hydrochloric acid aerosols treated in the Catalytic Reforming process.

Off-site transfers decreased by over 295,500 pounds for 2008. The decrease is primarily due to new analytical data for nickel and vanadium compounds in the gasifier slag sent off-site for recycle or disposal, and offset by an increase of over 99,000 pounds of molybdenum trioxide catalyst sent off-site for recycle.

Rank #3 - Edge Moor/Hay Road Power Plants - Oil- and coal-fired power plants were required to report under TRI for the first time for 1998. The Edge Moor/Hay Road facilities are located along the Delaware River a mile north of the Port of Wilmington and produce electricity from the combustion of coal, oil, and natural gas.

The Edge Moor/Hay Road power plants reported on eighteen TRI chemicals for 2008. These facilities reported three acid gasses, nine metal compounds, four non-metallic PBTs, nitrate compounds, and ammonia. Electricity production at the facilities decreased 20% in 2008. Also, because of a change in the mix of types of fuel used (an increase in percent of #2 oil, a

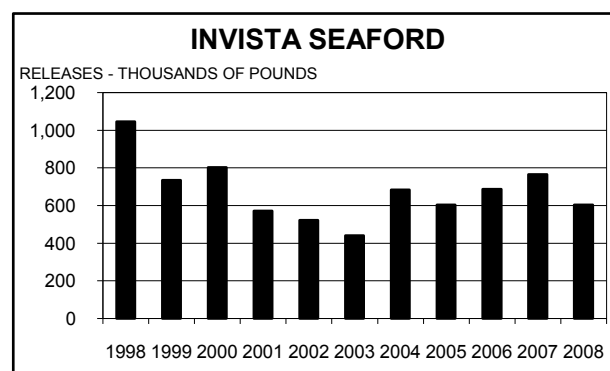
decrease in percent of #6 oil, natural gas usage, and in coal), overall on-site releases decreased 22% compared to 2007 and are now at 70% of the facility's 1998 level. Acid gas emissions -- hydrochloric acid, hydrogen fluoride and sulfuric acid -- accounted for 98.8% of on-site releases. The decrease in on-site release amounts for hydrochloric, hydrogen fluoride, and sulfuric acid gasses were the result of a decrease in coal and oil use due to decreased electricity generation. All listed compounds except ammonia are formed during the combustion process because of impurities within the fuel. Ammonia is released from the Edge Moor facility solely from the use of urea, a pollution control agent used for limiting the formation of oxides of nitrogen to the atmosphere. Ammonia is also used at the Hay Road facility for pollution control.



Over 94% of the metal compounds produced as a result of fuel combustion are largely captured in the fly ash and bottom ash and were not released, but disposed of in an off-site landfill. The remaining 6% of metals not captured in ash were released to on-site air (4%) and water (2%). On-site releases of metal compounds accounted for 1.1% of the facility total on-site releases.

Rank #4 – INVISTA Seaford - This facility was the first plant worldwide to produce spun nylon fibers, beginning operations in 1939. INVISTA's Seaford site is located on approximately 648 acres adjacent to the Seaford Golf and Country Club and the Nanticoke River.

Principal products produced at INVISTA's Seaford site in 2008 include Bulk Continuous Filament (BCF) nylon yarn for carpets (marketed under globally-known brands such as STAINMASTER® carpet and ANTRON® carpet fiber), staple fiber for combat uniforms and chemical-resistant clothing for the U.S. military, staple fiber for tennis balls, pool table coverings, "gaming" felts, and staple fiber for conveyor belts used in paper manufacturing.

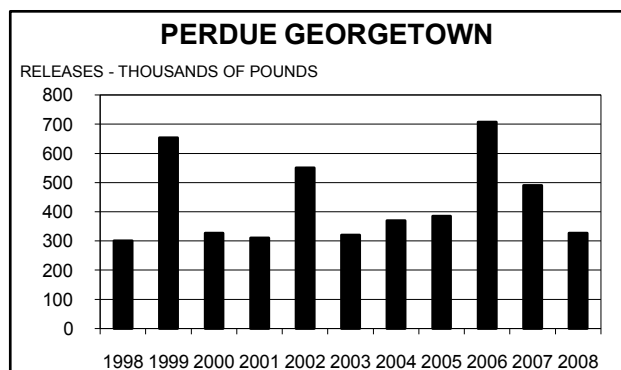


The INVISTA Seaford facility reported on ten TRI chemicals for 2008. Total reported on-site releases decreased 160,700 pounds (21%) from reporting year 2007. Of the ten TRI chemicals reported, 99.8% of the on-site releases were comprised of three chemicals: hydrochloric and sulfuric acid aerosols (released to air) and nitrate compounds (released to water). Combustion of coal in the INVISTA power facility produces hydrochloric and sulfuric acid aerosols which are released to air from the power plant stack. The coal contains small amounts of chlorine- and sulfur-containing compounds that convert to acid gases in the combustion process. Nitrate compounds are produced during the facility's biological treatment of nylon process wastewater.

The facility's overall fuel usage in 2008 decreased from the 2007 reporting year. As a result, sulfuric acid aerosol releases decreased by 6.5% (5,000 lbs) due to the decrease in the amount of coal burned as compared with the 2007 reporting year. However, the hydrochloric acid releases were 70,000 pounds higher (33%) in 2008 as compared with 2007 because of an increase in the concentration of chlorine present in the coal being burned.

Nitrate compounds releases decreased by approximately 46% (210,000 lbs) due to a decrease in nylon production and the associated treatment of wastewater as well as a decrease in the volume of water diverted to the facility's treatment facility from stormwater outfall diversions.

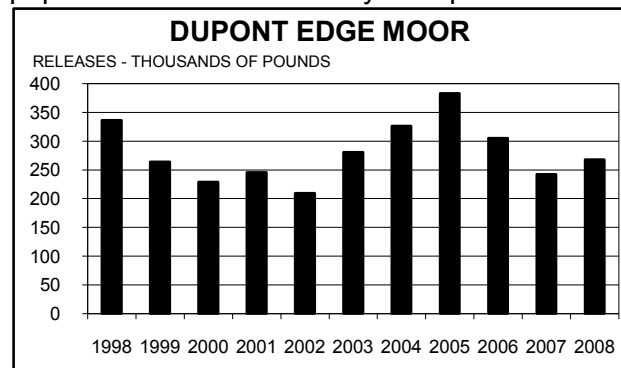
Rank #5 - Perdue Farms Georgetown - Perdue Farms is a producer of poultry products. The Georgetown facility processes chickens for sale to the retail market.



Perdue Georgetown reported on four TRI chemicals for 2008. Over 99% of the on-site releases were nitrate compounds. The Perdue wastewater treatment plant digests ammonia and production waste from the poultry processing plant's wastewater stream and converts some of these wastes to nitrate compounds.

These reported on-site release amounts have varied in recent years because of changes in plant operation and in the way the amount of nitrate compounds released are estimated. In 2006, the reported amount increased as a result of optimization testing for the new NPDES permit. In 2007, the nitrate compound amount reported at the plant significantly decreased as a result of reduced nitrate concentrations, reduced wastewater amounts, and application of a more accurate factor for nitrate releases. In 2008, nitrate compounds continued to decrease as the wastewater system operations continued to improve through revisions to the original design. The reported nitrate compound amount for 2008 declined by 51% compared to 2006 and 33% compared to 2007. Although production had minimal changes from 2007, total on-site releases of 327,477 pounds reported for 2008 decreased by 162,439 pounds compared to the total of 489,916 pounds for 2007.

Rank #6 - DuPont Edge Moor - The Edge Moor Plant is one of three domestic DuPont facilities that manufactures titanium dioxide, a white pigment that is used in the paint and paper industries. The facility also produces titanium tetrachloride and ferric chloride. The plant



is located along the Delaware River a few miles north of the Port of Wilmington.

DuPont Edge Moor reported on 22 TRI chemicals for 2008. Although production was slightly lower in 2008, on-site releases increased by 10% compared to 2007. Release of hydrochloric acid to air increased by 16,300 pounds compared to 2007 due to better characterization of some emission constituents. The release of manganese

compounds to water increased by 22,300 pounds as a result of process and raw material variability. The on-site release of carbonyl sulfide decreased by 14,000 pounds in 2008. This decrease can be attributed to process optimization of start-up and shut-down conditions. Carbonyl sulfide is a gas by-product of the titanium dioxide production process, and is produced from the use of sulfur-bearing coke in the process of manufacturing the titanium dioxide from titanium-rich ores. Of the 22 reported TRI chemicals, carbonyl sulfide accounted for 73% of the facility total reported on-site release amounts and manganese compounds accounted for 12%.

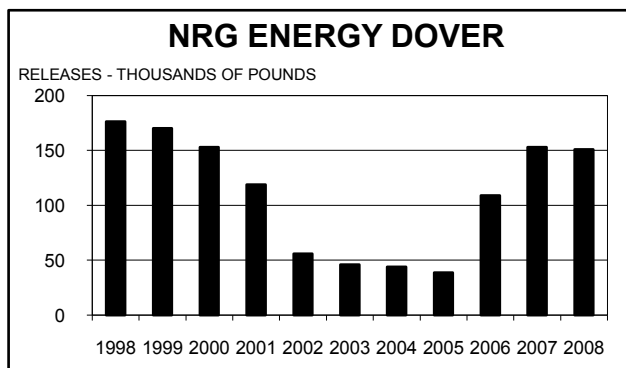
The term “dioxins” is used in this report to indicate a group of 17 dioxins and dioxin-like compounds (including furans) reportable to TRI, out of a family of several hundred dioxins and dioxin-like compounds. Among the “dioxins” included in TRI reports is the very toxic 2,3,7,8-TCDD dioxin, which is the congener generally of most concern, and most commonly covered by the news media. Toxicity levels of these 17 compounds vary greatly, and some compounds in this group have toxicity levels **3,333 times less** than the 2,3,7,8-TCDD dioxin. Because of this great variation, toxicity equivalent quantities (TEQ) are also calculated and presented on pages 40-41 in this report. The great majority (90%) of the “dioxins” reported by DuPont Edge Moor is either a furan or dioxin of this lower toxicity level. The most toxic dioxins (2) were 0.32% (0.0019 grams) of all dioxin on-site releases reported by this facility. All TRI “dioxins” are reportable in grams, and were converted to pounds for this report. (1 gram = 0.002205 pounds).

Dioxins and dioxin-like compounds are also created as a result of ore processing. Compared to 2007, the dioxin on-site and off-site releases decreased by 95.6%. The on-site release of dioxins (0.59 grams) decreased by 88.5% (4.52 grams) in 2008 compared to 2007. This decrease was mostly due to a reduction of 4.32 grams released to water as a result of process changes implemented with the goal of reducing formation of dioxins and also due to the availability of more quantitative analysis. The majority of “dioxins released to water” (0.57 grams) reported by DuPont Edge Moor is either a dioxin or furan of the lowest toxicity level.

Over 99.94% (957.59 grams out of 958.2 grams generated) of the dioxins generated are contained within the solid material sent to an out-of-state landfill facility. In 2002, DuPont announced a goal to reduce the generation rate of dioxin and dioxin-like compounds by 90% by year end 2007 compared with 2001 levels. DuPont Edge Moor completed a major capital construction project in 2007 to provide these reductions. Through 2008, DuPont reduced by more than 99.9% the on-site release of dioxin and dioxin-like compounds from 2001 levels, and reduced off site transfer for disposal of these compounds from the Edge Moor plant by 98.6% by implementing the capital project and by making process modifications.

DuPont Edge Moor also reported creosote releases to land in 2007 and 2008. Creosote was reported because the site exceeded the otherwise use threshold when it replaced approximately 1000 railroad ties that were treated with creosote in 2007 and 335 ties in 2008.

Rank #7 - NRG Dover Plant - Oil- and coal-fired power plants were required to report under TRI for the first time for 1998. This facility, located on the West side of Dover, produces electricity primarily from the combustion of coal. The NRG Dover Plant reported on four TRI chemicals for 2008. Two of these were acid gases - hydrochloric acid and sulfuric acid - formed during the combustion process. Acid gas released on-site accounted for over 99.9% of the facility on-site releases. Small amounts of metal compounds are also formed during

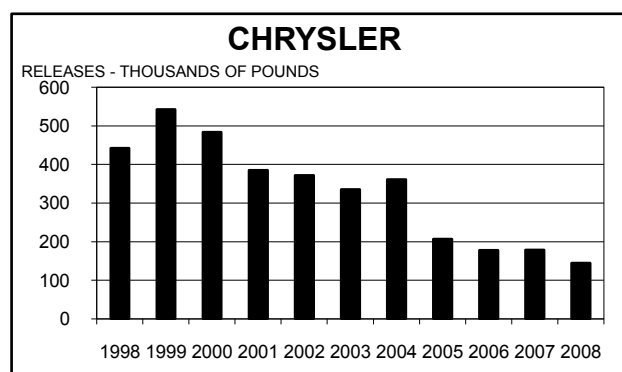


combustion because of metallic impurities in the coal and 39% of these amounts were captured in the fly ash and bottom ash and sent to an off-site landfill. The remaining 61% (2.5 pounds of lead compounds and 8.9 pounds of mercury compounds), were released on-site to air.

The decrease in the 2002 reported releases was the result of using actual coal mine data as a basis for estimating releases of hydrochloric acid aerosols. This new basis

reduced the reported release of hydrochloric acid by 65% (63,000 pounds) in 2002, and the hydrochloric acid release amount was nearly the same for 2003. The sulfuric acid release in 2003, however, was lower by 47%, the result of applying a coal mine coal cleaning factor which was included for the first time that year. For 2005, production increased by 4% while reported releases decreased by 12%. This reduced release amount was because of the lower sulfur content in coal purchased in 2005, which resulted in a 38% reduction in the reported sulfuric acid release. Although electricity production declined 24% in 2006, estimated release of hydrochloric acid increased to 100,000 pounds, a 213% increase over 2005. This increase was because of a change in coal suppliers in 2006, analyses showed the new coal to have higher chlorine content than previously fired coals. In 2007 electricity production increased 39% and on-site releases increased in proportion to this increase. In 2008, electricity production decreased 17%, and on-site releases decreased slightly.

Rank #8 – Chrysler Newark Assembly Plant - Chrysler assembled the Dodge Durango and Chrysler Aspen SUV for distribution to dealers in 2008. This facility closed in December 2008.



Chrysler reported on 14 TRI chemicals for 2008. All on-site releases were to the air. Many of these are solvents used in paints or for parts cleaning, while others are materials that are incorporated into the cars themselves, such as ethylene glycol (antifreeze) and n-hexane (gasoline).

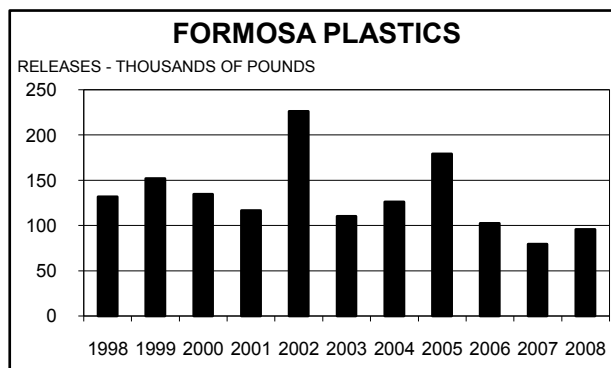
The vehicle body coating process makes use of 1,2,4-trimethylbenzene, certain glycol ethers, methyl isobutyl ketone, n-butyl alcohol, and xylene. Some of these

materials are also used elsewhere in the facility. In total, these chemicals accounted for approximately 87% of the Chrysler on-site releases in 2008. Chrysler accounted for about 80% of certain glycol ethers and 62% of all xylene releases in the state in 2008.

This facility had a production decrease of 34% in 2008; but the on-site releases declined about 19% due to the fact that some materials reported are not incorporated into the vehicles themselves and do not directly increase and decrease with production. Other material usages and releases, even with continuing pollution prevention activities, may increase with decreasing production because of the additional solvent usage required in the assembly and painting processes for purging lines because of more system shutdowns and startups.

Rank #9 - Formosa Plastics - Formosa Plastics, located in the Delaware City complex, produces polyvinyl chloride (PVC) resin for bulk sale to other industries that produce PVC based products, such as containers, flooring, carpet backing, upholstery, toys, and gloves.

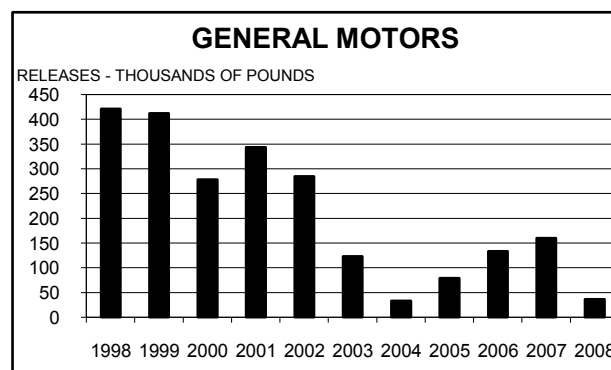
Formosa reported on three TRI chemicals for 2008. Vinyl acetate accounted for 34% of Formosa's on-site releases for 2008. Vinyl acetate is also a raw material used in certain products and is released through the drying process. Vinyl chloride monomer (VCM) accounted for 52% of the facility on-site releases. VCM is the primary ingredient for producing PVC and is released as residual unreacted monomer during the drying process of the PVC resin. Permits regulate the concentration of the residual monomer in the PVC before drying. Ammonia is also used in several of Formosa's products and is released during the PVC drying process. Ammonia accounted for 14% of Formosa's on-site releases in 2008.



For 2008, total on-site releases were up 20%, and production was slightly above the 2007 level. Reported release of vinyl acetate increased 15% and vinyl chloride increased 34%, while the ammonia release was 5% lower. The reason for the increased releases is an increase in residual vinyl chloride and vinyl acetate, which is then dried out of the PVC.

Rank #10 - General Motors Wilmington Assembly Plant - General Motors assembled Pontiac Solstice and Saturn Sky automobiles for distribution to dealers; the Opel GT for export to Europe, and the Daewoo G2X for export to Korea. This facility closed in July 2009.

Production declined in 2008 and was 44% of the 2007 level, while on-site releases were 23% of the 2007 amounts. GM reported on nine TRI chemicals for 2008. Many of these are solvents (certain glycol ethers, n-butyl alcohol, xylene) used in paints or for parts cleaning, while others are materials that are incorporated into the cars themselves, such as ethylene glycol (antifreeze). Xylene, certain glycol ethers, and 1,2,4-trimethylbenzene are paint solvents used in both the base and top coats and accounted for 75% of GM on-site releases in 2008. General Motors accounted for about 3% of certain glycol ethers, 27% of 1,2,4-trimethylbenzene, and 9% of all xylene releases in the state in 2008.

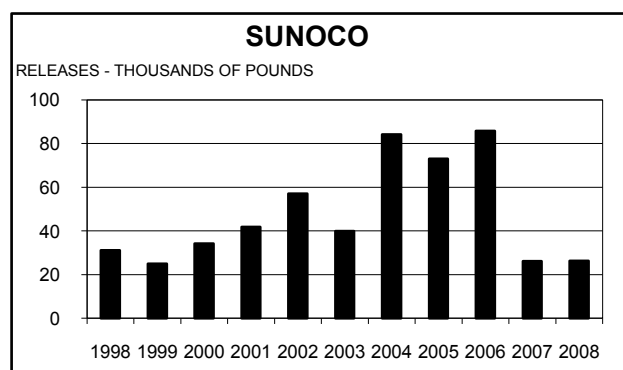


During 2004-5, the plant underwent a significant model change-over and production was curtailed, but some TRI chemicals remained in use for non-production cleaning and other changeover activities. In 2006, production re-started and releases of TRI chemicals increased in proportion to production, while non-production releases continued at a lower level. Production continued to increase in 2007, but declined during 2008.

Rank #11 – Mountaire Farms of Delaware – This facility, located in Millsboro, hatches chickens for growers, produces feed for poultry growers, and produces retail, wholesale and export chicken products. The predominant chemical reported is ammonia. Almost 95% of on-site ammonia release was to land. Total on-site release for 2008 was 32,835 pounds; ammonia released to land was 31,191 pounds. Ammonia is a byproduct of poultry processing and is treated in the on-site wastewater treatment plant. Due to changes in operations at the wastewater facility, an increase in the ammonia concentration in the treated wastewater effluent occurred. This effluent is spray irrigated onto cropland. Some ammonia is utilized by the crops and the remainder evaporates into the air.

This facility has not reported to TRI since 2003. Since this is only the first year of TRI reporting for this facility since 2003, no trend is available. A trend will be provided in future years if reporting continues and when a meaningful range of data is available.

Rank #12 – Sunoco Refining and Marketing – Sunoco, located in Marcus Hook, PA, the facility extends into the North Claymont area of Delaware. The Marcus Hook facility can process 180,000 barrels a day of crude oil into fuels – including gasoline, aviation fuel, heating oil, residual fuel, propane and butane, and petrochemicals. The major petrochemicals are benzene, toluene, xylene, cyclohexane, propylene, ethylene, and ethylene oxide; these are sold to chemical companies, which use them to make a variety of other products.



The portion of the Sunoco facility in Delaware reported four TRI chemicals in 2008. Ethylene and ethylene oxide accounted for 78% of the total on-site Delaware releases for 2008, and smaller amounts of benzene and xylene were also reported as released to air from tanks in Delaware.

For 2008, on-site releases increased by 200 pounds. Ethylene and ethylene oxide releases decreased 600 and 500 pounds

respectively, while benzene increased 1300 pounds and xylene remained unchanged. The decrease in ethylene and ethylene oxide releases were a result of new emissions data from recent stack tests and speciation of fugitive emissions. The increase in benzene emissions was the result of a modified calculation to account for heated tanks.

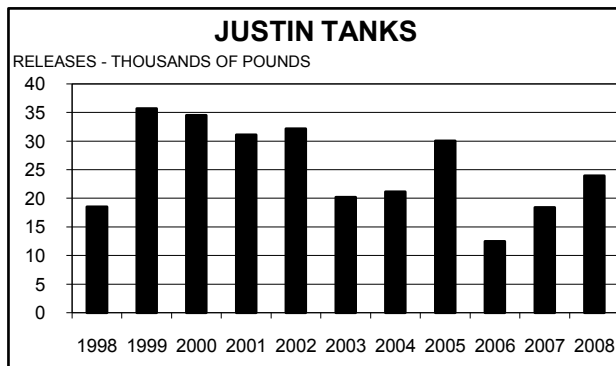
After an explosion and fire in May, 2009, Sunoco announced that the ethylene complex in the refinery would close due to insufficient demand for ethylene, ethylene oxide, and cyclohexane to justify the cost of repair and replacement of damaged equipment.

Rank #13 - Justin Tanks – Justin Tanks, located in Georgetown, manufactures a wide variety of Fiberglass Reinforced Plastic (FRP) tanks for use in the chemical, agricultural, and food industries.

Justin reported on one TRI chemical, styrene, for 2008. Styrene is used as a monomer in the polymerization of fiberglass resin. The majority of the styrene is released to the air during

the application process of fiberglass to the tank. During polymerization and curing, small amounts of styrene are released, and the amount of styrene release diminishes to zero at full cure. No release occurs after the tank polymerization and curing process is complete.

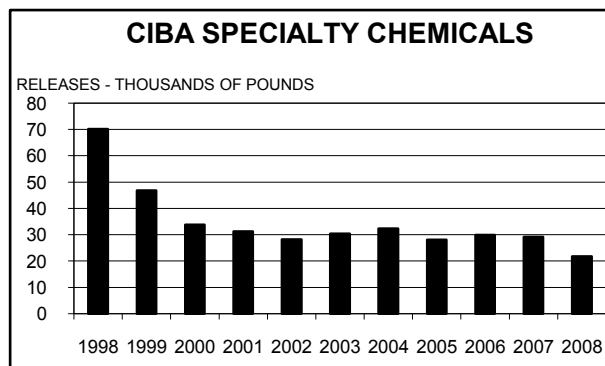
On-site releases increased 5,553 pounds (30%) compared to 2007, the result of an 18% increase in production.



Rank #14 – Ciba Corporation - Ciba Corporation is located in Newport. Ciba manufactures pigments for the paints, plastic, and printing industries. They reported on eight TRI chemicals for 2008. All on-site releases were to air.

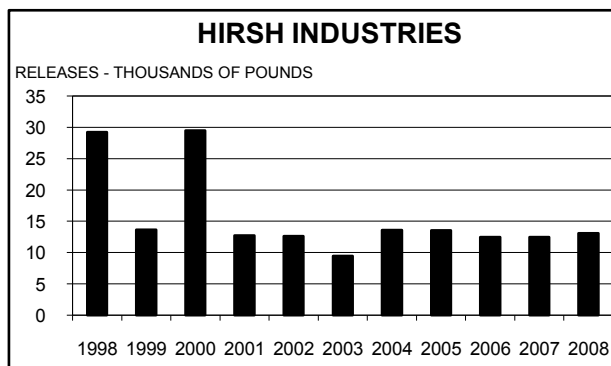
Methanol was the predominant chemical released on-site in 2008 (93% of total on-site releases). Methanol is used as a reactant and a solvent in the pigment manufacturing process. A significant portion of methanol used at the facility is recycled.

Total pigment production was down 10% in 2008, and overall on-site releases decreased 25% because of this and also because of a different pigment assortment manufactured. Ciba has expanded and modernized their facility since 1998. Although facility capacity has increased by 67% since 1998, they have achieved a 69% reduction in on-site releases during this time. They have also reduced transfers of methanol to off-site water treatment by 76% since 1998.



Rank #15 – Hirsh Industries – Hirsh Industries produces a line of consumer durables. These products include file cabinets, shelving units, and lateral filing systems. These items are used in home and office applications. Hirsh Industries is located in North Dover.

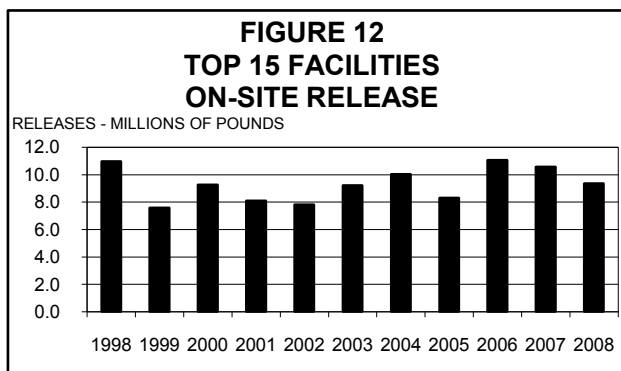
Hirsh reported one TRI chemical in 2008, certain glycol ethers. It is used as a component in the water based coatings for their painting process. The volume of production activities involving certain glycol ethers was relatively unchanged in 2008. However, on-site releases increased by 5% compared to 2007. The increase was attributed to coating formulation changes which occurred when Hirsh changed coating vendors. Total on-site release is now at 45% of the 1998 amount. The earlier



downward trend during 2000-2003 is partially the result of a decline in production which has stabilized in recent years.

Recent initiatives directed toward reduction of on-site releases include the introduction of several new and reformulated coatings with reduced VOC and HAPS content. Although Glycol Ethers emissions increased in 2008, Hirsh's VOC emissions for the year (which include non-TRI chemicals) decreased.

Combined Top 15 Facilities Trend - Figure 12 shows the totals for reported on-site releases for the top 15 facilities during 1998-2008. The total on-site release trend for these 15 facilities is down 11.3% since 2007.

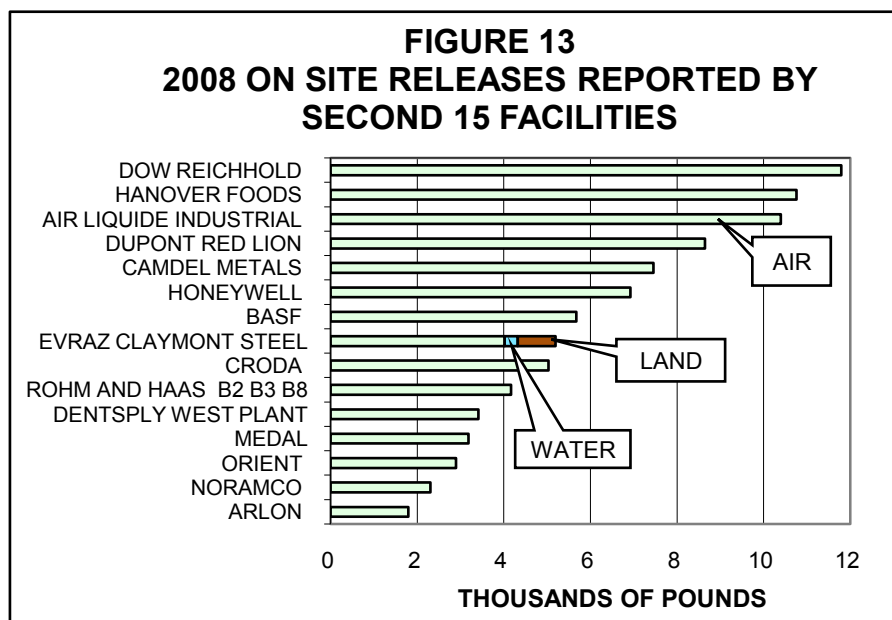


These facilities represent 99% of the total on-site releases in the State for 2008. Seven facilities reported increases in 2008. The largest was the 100,000-pound increase at the Indian River Power Plant as a result of move away from off-site disposal and toward on-site disposal of ash. Eight facilities reported decreases in 2008; the largest was the 465,000 pounds decrease reported by the Premcor refinery (#2). All reportable chemicals are included without adjustment to the data shown on this graph and on the ones above for the individual facilities.

Releases from the Second 15 Facilities

As with the first 15 facilities, a brief description of the second 15 facilities is presented on the next several pages. Again, the ranking is based on the total facility reported on-site release. Releases to air constitute about 98.7% of this group's total on-site release, while releases to water and land each contribute less than 1%. Figure 13 shows the amounts and relative portions released to air, water, and land by each of the second 15 facilities.

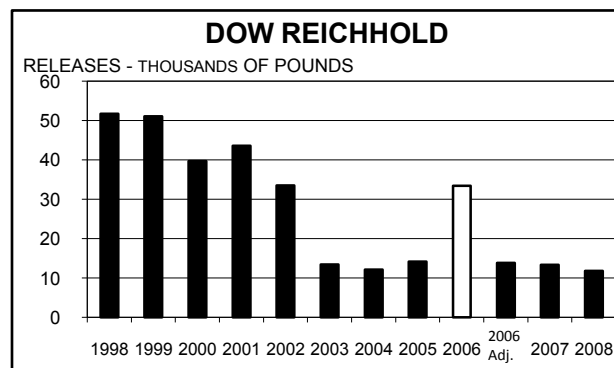
On-site releases decreased by 15% for this group of facilities for 2008. Eleven facilities reported reductions; the largest being a 5,335-pound decrease reported by Air Liquide America, dropping from #14 in 2007 to #18 in 2008. Four facilities reported increases or were new for 2008. The facility with the largest increase was Honeywell, reporting a 3,523-pound increase and climbing from #29 to #21 for 2008. The trend of this group is shown in Figure 14 on page 37. Over time, some facilities in this group may move up to the top 15 group or out of the top 30 entirely.



The facility with the largest increase was Honeywell, reporting a 3,523-pound increase and climbing from #29 to #21 for 2008. The trend of this group is shown in Figure 14 on page 37. Over time, some facilities in this group may move up to the top 15 group or out of the top 30 entirely.

Rank #16 - Dow Reichhold – Dow Reichhold is located two miles south of Cheswold. Dow Reichhold produces emulsion polymers, sometimes referred to as latex. These products are sold in bulk liquid form and are used in the manufacture of synthetic fuels, nitrile rubber gloves, textiles, and other specialty products.

Dow Reichhold reported on ten TRI chemicals in 2008. Most of these are raw materials used to form the emulsion polymers. On-site releases reported for 2008 were 12% lower than for 2007.



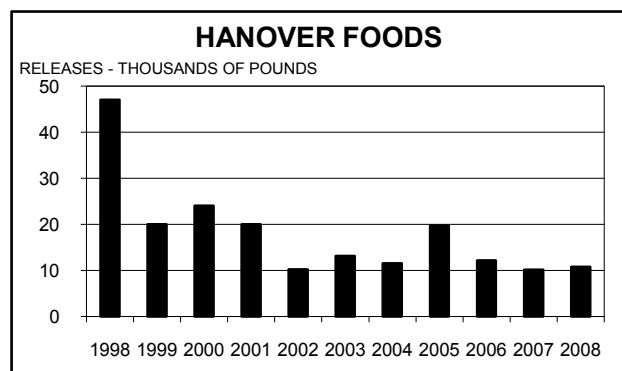
The facility stopped production in November 2008, but cleanup activities continued into 2009. DNREC is working closely with the facility to ensure that cleanup obligations are met and that there will be no adverse environmental impact as a result of the closing.

In 2006, a railcar containing styrene at the facility spontaneously polymerized, releasing some styrene to the air. That is the reason for the large increase in 2006. The railcar was not hooked up to any plant processes and no fire or explosion occurred at the facility. There were no serious injuries at the facility or in the nearby community. If on-site releases are adjusted for this non-production related release as shown on the above graph, releases in 2006 would be 3% lower than the 2005 amount. In 2007, reported on-site releases were 412 pounds (3%) lower than the adjusted amount for 2006, while production increased by 6%. As the facility prepared to close, it reported a 12% reduction in releases for 2008, and production declined 32% compared to 2007.

On-site release of 1,3 butadiene accounted for 31% of the total on-site production releases in 2008. Between 1998 and 2008, releases of 1,3 butadiene have declined by 87%. Releases of acrylonitrile accounted for 18% of the 2008 on-site releases, and have declined by 66% since 1998. Releases of styrene accounted for 12% of the total on-site production releases in 2008, and have declined by 76% since 1998. Pollution control equipment processed the residual monomers and achieved 98.0-99.9% removal efficiency before releasing its exhaust to the air.

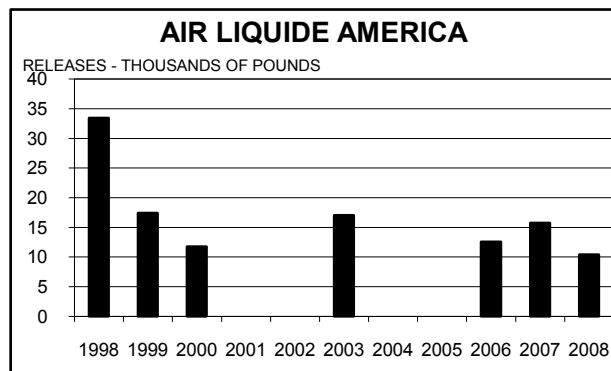
Dow Reichhold's production-related on-site releases decreased by 73% from 1998-2008. The reductions are partially the result of declining production, but also the result of implementing a more rigorous Leak Detection and Repair (LDAR) program. Some of the reduction was also attributable to improvements in the conversion of monomer in the production formulas.

Rank #17 - Hanover Foods - Hanover Foods Corporation produces a variety of fresh, frozen, and canned vegetables, soups, refrigerated and frozen entrees, and snack foods. Customers for these products include the retail, foodservice, military, club store, and industrial markets.

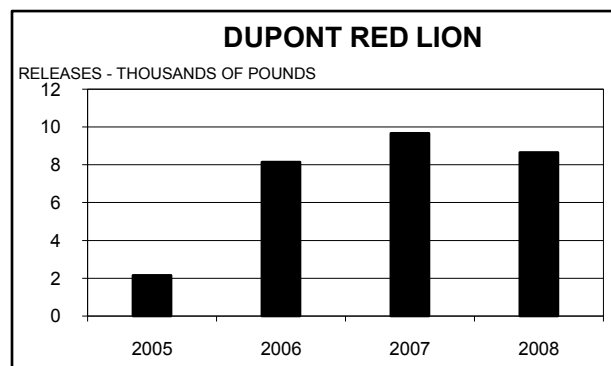


The Hanover Foods facility located in Clayton freezes fresh vegetables including corn, peas, lima beans, spinach, and squash, and prepares, freezes, and packages entrees. Hanover reported ammonia releases for the past several years. This was primarily due to leaks and other losses in their refrigeration equipment. In 1999, with the assistance of DNREC's Emergency Planning and Response Branch, a program to reduce ammonia releases was begun, and Hanover's on-site releases have decreased by 78% since 1998. In recent years, the increase and decrease of ammonia releases generally reflect the level of production. In 2005, production increased 50% but the reported ammonia release increased 72%, the result of leaks and losses associated with the installation of additional equipment. In 2008, production increased about 5% and releases increased 650 pounds (6%).

Rank #18 - Air Liquide America Air Liquide is located in Delaware City and produces liquified carbon dioxide from a gas stream received from a nearby facility. The carbon dioxide is used by many industrial and food processing facilities in the region. Air Liquide reported on one chemical, ammonia, in 2008. Ammonia is used as a refrigerant to condense the carbon dioxide. In 2001, 2002, 2004 and 2005 this facility did not meet the minimum reporting threshold for reporting to the TRI program. This is reflected in the graph. The facility resumed TRI reporting in 2006. The reported increase for 2007 was because of a condenser leak. The condenser was replaced in January 2008. The TRI report showed a reduction in ammonia release to air of 34% (5,300 pounds) compared to 2007. The reduction is due in large part to the replacement of the ammonia condenser.

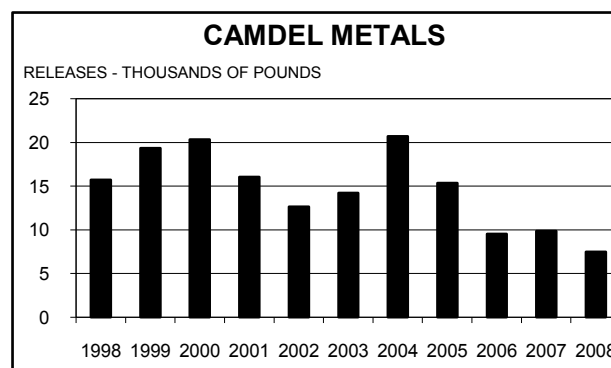


Rank #19 - DuPont Red Lion – This facility, located north of the Premcor Delaware City refinery, manufactures sulfuric acid derived from spent sulfuric acid and refinery gas received from the refinery. The spent sulfuric acid and refinery gas are received by pipeline, and the fresh acid is shipped from the facility via pipeline, tank trucks and tank cars. The facility has the capacity to manufacture 550 tons/day of sulfuric acid. The approximate volume of sulfuric acid manufactured by this facility was 360 tons/day in 2008.



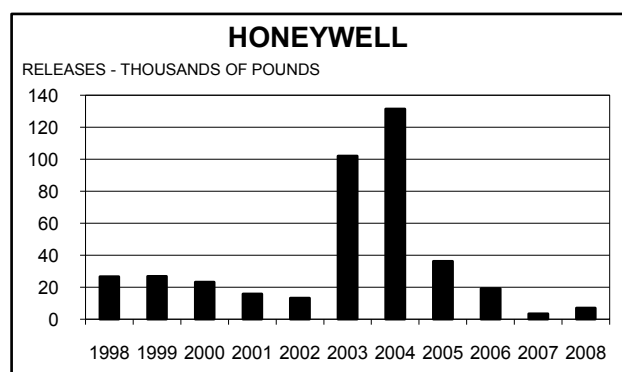
This facility started up and reported on a partial year of production for the 2005 reporting year. On-site releases from this facility for 2007 were 9,658 pounds of sulfuric acid gas released to air, an increase of 19%, proportionate to the 21% increase in production for 2007. For 2008 the facility released 8,646 pounds, a 10% reduction, in line with the 10% production decrease.

Rank #20 - Camdel Metals - Camdel Metals Corporation specializes in the production of seamless & welded stainless steel coiled and straight length tubing. These tubes are produced for numerous petrochemical applications, process construction, general control systems, instrumentation, medical, military, oil & gas, down hole and sub-sea umbilical applications. Camdel Metals produces continuous seamless coils which can be in excess of 6,000 feet. The tubing ranges in size from .020 to 3/4 inch diameter. Trichloroethylene (TCE) is the primary TRI chemical reported by Camdel Metals, and makes up 100% of the on-site release amount. It is used as a solvent to clean the tubing. Production increases related to TCE use in 2003 (15%) and



2004 (43%) accounted for most of the on-site release increases since 2002, and releases generally tracked production. Although production volume related to use of trichloroethylene fell 15% in 2006, trichloroethylene releases fell by 38%, the result of improved process control and waste management. In 2008, production declined by 20%, but TCE releases decreased by 24%, the result of additional process control and preventative maintenance actions. Over 99.9% of the scrap metal generated at the facility is sent off site for recycle.

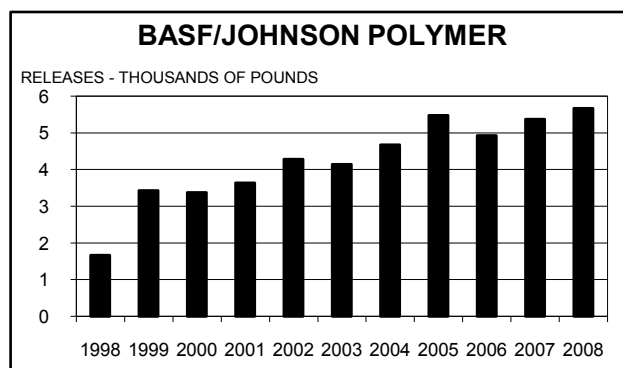
Rank #21 – Honeywell International - Honeywell, located in Claymont, manufactures specialty chemicals that are used in agricultural, pharmaceutical, and household products. This facility also produces boron trifluoride, used in the production of hydrocarbon resins, lubricants, and adhesives.



The Honeywell facility reported on nine TRI chemicals in 2008. All on-site releases were to air. Releases of boron trifluoride, n-hexane, and hydrogen fluoride accounted for 92% of the on-site releases. Although production increased 17% in 2003, the primary reason for the increase in the reported amount that year was that Honeywell performed stack testing and is using this more accurate basis for estimating releases.

In 2004, production increased 31% and the increase in on-site releases is a direct result of the production increase. During 2005, Honeywell completed a two phase emission control project that decreased on-site emissions by 72% even with a production increase of 11%. In the 2006, the combination of 11% reduced production and the full year impact of the phase one of the emission reductions project further reduced on-site releases by another 47%. Most of this impact was for n-hexane, falling by 60% compared to 2005. In 2007, total on-site releases fell by 15,865 pounds (82%) compared to 2006 due to the full year impact of the phase two emission reduction control project. Although production fell by 15%, releases of n-hexane fell by 8,827 pounds (82%), boron trifluoride fell by 1,173 pounds (70%). In 2008, production increased by 15%, but on-site releases increased by 3500 pounds. A change in the emission calculation method resulted in a 3000-pound increase in n-hexane release and a 500-pound report for ammonia, which crossed the reporting threshold in 2008.

Rank #22 – BASF - This facility, formerly known as Johnson Polymer, changed ownership in 2006. BASF was responsible for preparation of the TRI data for this facility starting in 2007.



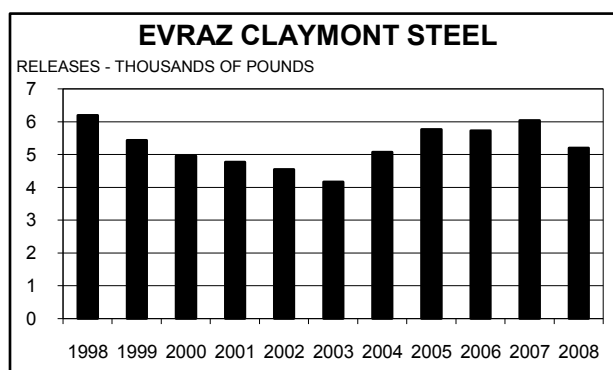
This BASF facility manufactures emulsion polymers, sometimes referred to as latex, primarily for the printing and packaging industries but also used as additives for paints and coatings. Typical customers include ink and coating manufacturers.

BASF reported on six TRI chemicals in 2008. The total amount of individual releases reported in 2007 increased by 6%, the result of a 9% production increase. Ammonia was the highest on-site release

reported by BASF Seaford for 2008 accounting for 74% of all on-site releases. It is used as a reagent in the resin material and it is used to adjust pH in the process. Reported on-site releases of all chemicals have increased by 240% since 1998 primarily due to changes in methods used to more accurately estimate release amounts. Off-site transfers decreased by 53% because of utilization of the on-site wastewater pre-treatment system for processing plant water prior to being sent to the municipal wastewater treatment system.

Rank #23 – Evraz Claymont Steel - Located on a 425 acre site in Claymont, Evraz Claymont Steel, formerly known as CitiSteel, manufactures high strength low alloy carbon steel plate for heavy construction and industrial applications. The facility purchases and recycles over 500,000 tons of scrap steel annually and melts it in an electric arc furnace making this facility the largest metal recycler in the state of Delaware. The melted steel is cast into large slabs which are rolled into plates of thicknesses from 1/4" to 5-1/2". The plates are sold throughout North America.

Evraz Claymont Steel reported on-site releases of eight TRI chemicals; seven metallic compounds and dioxin compounds, in 2008. Most of the on-site releases, 77%, were to air. Zinc compounds was the largest on-site release, at 53% of the total. For 2008, on-site releases decreased 14%. The decrease in the 2008 total on-site release amount was due, in significant part, to enhancements to the facility's emission control programs, including the baghouse preventative maintenance program, the implementation of a pollution prevention program to limit the presence of contaminants in scrap received by the facility, and a 10% decrease in production compared to 2007. Further reductions are expected during following years. Since 2005, reported mercury emissions from Evraz Claymont Steel have decreased 33%. For 2008, reported mercury released on-site declined 28 pounds, or 10%, compared to reported levels for 2007.



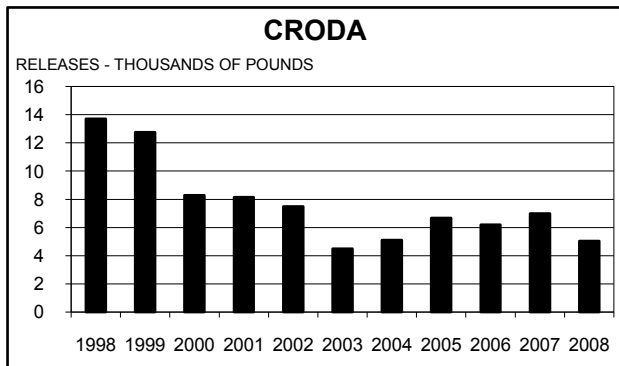
In 2006, Evraz Claymont Steel implemented a comprehensive Mercury Source Reduction Program. In August 2006, as part of this program, Evraz Claymont Steel joined with other stakeholders and the EPA in announcing the National Vehicle Mercury Switch Recovery Program (ELVS). This program is designed to recover mercury switches used in lighting and braking systems in 2002 and older vehicles as they are being prepared for recycle. Mercury in these switches can contaminate steel scrap destined for recycling, and a portion of this mercury can be released to air during the steel melting process. Although Evraz Claymont Steel does not prepare vehicles for recycling, the company has committed to purchasing shredded automobile scrap steel from suppliers that are participating in the switch recovery program.

Since the program has started in 2006, Delaware has had a total of 1,628 switches (3.58 lbs of mercury recovered) turned into ELVS by DE vehicle dismantlers and scrap metal recyclers.

- As of July 2009, Delaware has 28 participants in the ELVS Program, with 1,350 Hg switches turned in so far (2.97 lbs of mercury recovered).
- In 2008 Delaware had 20 participants, with 278 switches turned in (0.61 lbs of mercury recovered).

Rank # 24 – CRODA - Formerly ICI Atlas Point, then Uniqema, these companies have occupied this site located in New Castle near the Delaware Memorial Bridge since 1971. **Croda International Plc** acquired Uniqema in September 2006. Founded in 1950 and headquartered in the United Kingdom, Croda is a manufacturer and supplier of natural-based

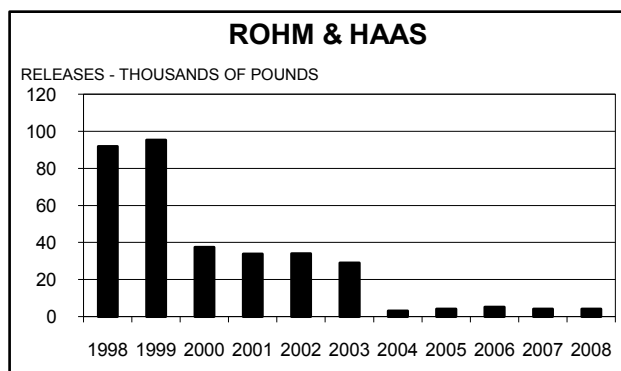
specialty chemicals for the personal care, pharmaceutical, household, and industrial markets.



The Croda facility manufactures products, known as surfactants, that promote the mixing of oil and water based ingredients in many consumer products, such as baby shampoo, shaving cream, mouthwash, pharmaceuticals, and many other personal care and industrial products.

Croda reported on ten chemicals for 2008. The majority (98%) of the on-site chemical releases were from ethylene oxide, methanol, and propylene oxide. All on-site releases for 2008 were to air, and declined by 28% compared to 2007. Since 1998 overall site emissions have decreased 63%. The recent increases in 2005-2007 were the result of the addition of a 20 million lb/year expansion to manufacture amine based chemicals and a modification to the product portfolio in response to market conditions. The decline in on-site releases for 2008 is the result of change in market demands and improved fugitive emission calculations.

Rank #25 – Rohm and Haas – This facility manufactures polishing pads and slurries for the semiconductor, electronics, and glass industries. The facility is located south of Newark in the Diamond State Industrial Park.

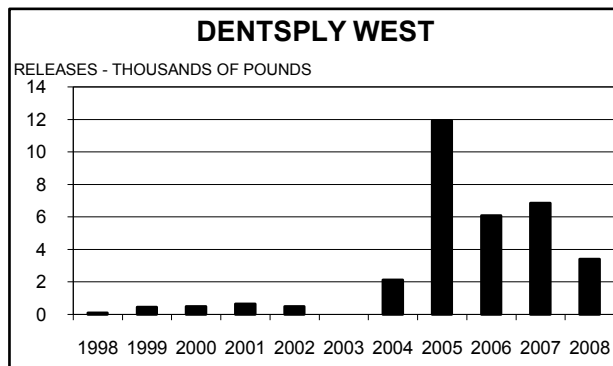


Rohm and Haas reported on three TRI chemicals for 2008. N,N-Dimethylformamide (DMF), is used as a solvent carrier in the polishing pad manufacturing process and accounted for virtually all of their on-site releases. The facility production decreased 12% in 2008, and total on-site releases decreased 1% as a result of production. On-site releases for 2008 were 4.5% of the facility 1998 levels. Releases of DMF mostly occur through evaporation from the poromerics coating and washing process.

The majority of the DMF used is recycled in the distillation equipment for reuse in the process. All on-site releases of DMF were to air, and were primarily stack emissions from the scrubber and oxidizer used to control process emissions.

Rank #26 – Dentsply West – Dentsply produces a line of consumable products for the dental industry. These products include dental adhesives, dental impression materials, and restoratives. These products are used in dental maintenance and restoration applications. Caulk's East Masten Circle facility (Dentsply West) and the West Clarke Avenue facility (Dentsply Main) are located in Milford.

Dentsply West reported three TRI chemicals in 2008. The predominant chemical released on-site was methyl methacrylate (MMA). It is used as a component in their process. Reported total on-site releases declined by 50% for 2008 compared to 2007; releases of toluene declined by 79%, the result of more accurate calculations and change in process which uses less toluene, releases of methanol declined by 88%, the result of more accurate calculation, and releases of MMA were unchanged.



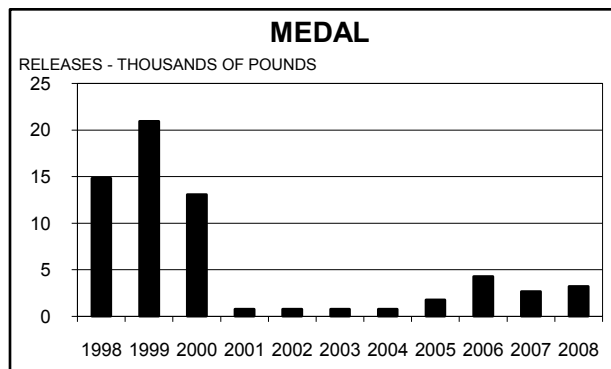
On-site releases have increased significantly since 2002 because of increased production, addition of new equipment, and more accurate reporting methods. In 2005, the facility reported significant increases in on-site releases for toluene and MMA, and the facility reported on-site release of methanol in 2005 for the first time since 2002.

This facility did not report any on-site releases for 2003.

The Dentsply Main facility is one of two facilities in the state that report on elemental mercury. Virtually all of their mercury is used in their products or recycled (3,445 pounds recycled), with reported on-site mercury releases of 0.02 pounds.

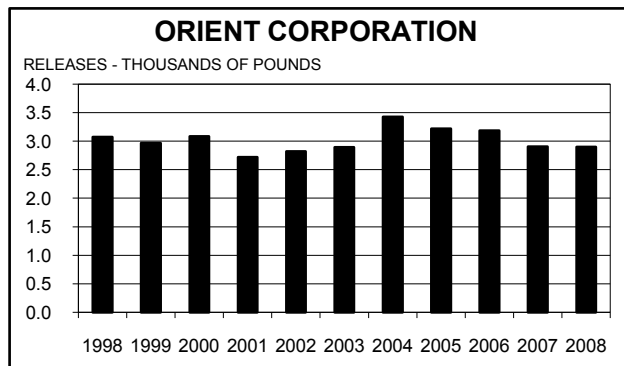
Rank #27 – MEDAL - MEDAL, a division of Air Liquide Advanced Technologies U.S. LLC, originally a joint venture begun in 1988 between Air Liquide and DuPont, has been a wholly owned subsidiary of Air Liquide since 1992. Based on DuPont's polymeric fiber spinning technology, Air Liquide/MEDAL has developed and commercialized gas separation membranes.

Located in Newport, MEDAL manufactures hollow fiber membranes for air separation/nitrogen generation, carbon dioxide removal and hydrogen purification. Applications for the gasses produced by the membranes include oil and gas drilling, controlled/inert atmospheres, maritime transport, beverage dispensing, tire inflation, and laboratory gas supply.



MEDAL reported on three chemicals: methanol, n-hexane, and n-methyl-2-pyrrolidone, for 2008. These chemicals are used in membrane production. All on-site releases were to air. Significant amounts of methanol and n-hexane are also recycled and reused on-site, with small amounts of methanol and n-methyl-2-pyrrolidone sent off-site for treatment. A significant change occurred in 2001, when MEDAL installed a thermal oxidizer, and as a result, on-site releases were reduced by 94% compared to 2000. Since that time, on-site releases have generally been tracking production with a 21% increase for 2008.

Rank #28 - Orient - Orient Corporation of America was established in Port Newark, NJ in 1979. Its parent company, Orient Chemical Industries, Ltd., is located in Osaka, Japan and was established in 1917. Orient distributes various dyes, pigment dispersions and charge control agents.

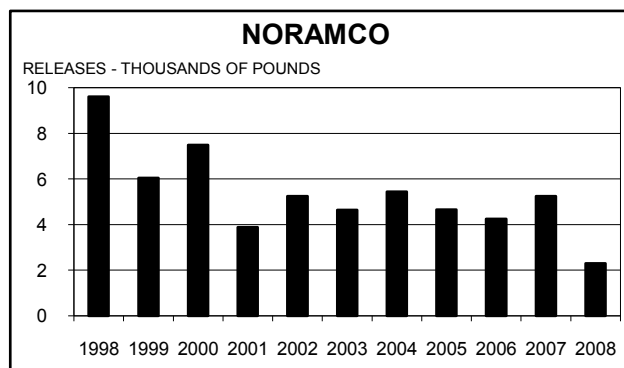


In order to meet the increasing demand for its products, Orient Corporation of America moved its manufacturing operations to Seaford, Delaware in 1991 where it constructed a new manufacturing facility for the production of Nigrosine Dye, a product used in phenolic and polyamide resins and special paints. Orient supplies a large share of domestic demand for this type of dye.

were unchanged compared to 2007, while production for 2008 was lower by 3%. Aniline was the predominant on-site release and accounted for 92% of the total. The remaining 8% on-site release was for nitrobenzene. Aniline and nitrobenzene are used in the production of dyes. Chromium and zinc compounds are purchased, repackaged, and sold as is, with no releases.

Although production levels have increased 19% since 1998, on-site releases have decreased 6%, the result of higher efficiency due to lengthening of the production cycle and a corresponding reduction of startup/shutdown times. There were no process changes that affected on-site releases during 2008.

Rank #29 – Noramco - Located in Wilmington, Noramco was formed in 1979. Noramco produces bulk active pharmaceutical ingredients used in pain relief medicines. The pharmaceutical products are primarily sold to Johnson & Johnson pharmaceutical sector finishing facilities and several large generic pharmaceutical companies in the United States.



Noramco reported on-site releases of six TRI chemicals in 2008. All on-site releases for 2008 were to air. Toluene and methanol made up 84% of the total on-site releases. On-site releases decreased by 56% in 2008 compared to 2007. This was the result of an increased focus on automation, operator training, and process technology improvements, including significant upgrades to the release prevention systems.

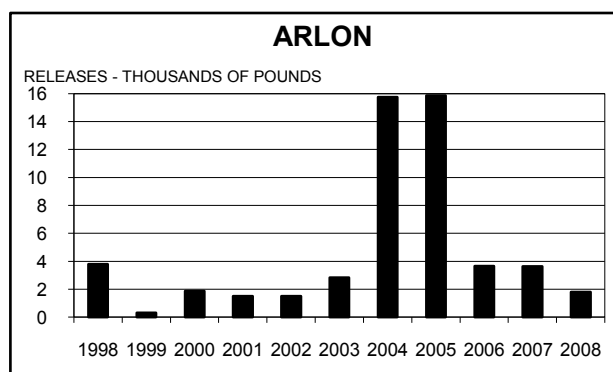
Reported dichloromethane releases reported by Noramco for 2008 fell by 84% (1,852 pounds) and methanol releases fell by 61% (991 pounds) compared to 2007 release amounts as a result of the redesign of key processes and implementation of new processes that reduced the number of chemical manufacturing steps. Production decreased by 18% in 2008 compared to 2007; however, overall production at Noramco has increased 50% from

2003 to 2008. During this same timeframe, the total reported TRI releases to air have decreased by approximately 50%.

In May 2007, an accidental release of 960 pounds of dichloromethane occurred, and that contributed to the increase in on-site releases reported for that year.

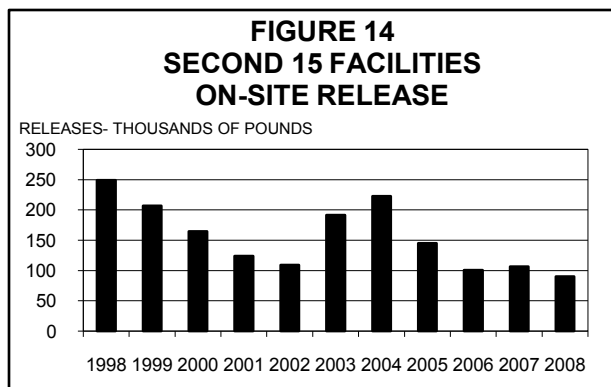
Rank #30 – Arlon –Arlon specializes in ceramic-filled fluoropolymers (i.e. PTFE) and other laminates that are used in frequency-dependent circuit applications such as base stations and antennas for wireless telecommunications. Arlon also produces precision calendared silicone rubber coated fabric sheets and specialty extruded silicone rubber tapes.

Arlon reported three TRI chemicals, ethylbenzene, xylene and copper, in 2008. Arlon uses xylene as a chemical processing aid in the coating of fiberglass with the silicone rubber dispersion. Ethylbenzene is a component found in many commercial grades of xylene. A vast majority of the solvents used in the coating process is destroyed in the on-site thermal oxidizer system. Copper is used in the antenna assemblies, and 95% of the copper waste was recycled.



On-site release amounts increased significantly in 2004 because of a failure in the heat exchanger in the thermal oxidizers that destroy solvent releases from the coating process. The heat exchanger was repaired in September 2005, and the release amount returned to near historical levels in 2006. In 2008 reported on site releases dropped by 51% compared to 2007. This change is attributable to improved, more accurate emission estimation methods.

Combined Second 15 Facilities Trend - Figure 14 shows a trend of the totals for the facilities ranked #16-30 for reported on-site releases. The trend is down by 15% for 2008 and down by 64% since 1998. Because of the decrease in amounts of the Second 15 group, its contribution to the state total decreased from 3% in 1998 to less than 1% in 2008. Facilities in the Second 15 group tend to be more closely spaced in their rankings with regard to pounds released on-site (compare Figure 11 on page 17 to Figure 13 on page 29). This adds to the variability in rankings from year-to-year as individual facility releases vary in their normal course of operations.



Persistent Bioaccumulative Toxic (PBT) Chemicals, 2000-2008

For reporting year 2000 and beyond, EPA established substantially lower reporting thresholds for 12 existing chemicals and one chemical category that are highly persistent and bioaccumulative in the environment (PBTs). Six new chemicals and one new category were also added to the PBT list for 2000. The new thresholds apply regardless of whether the PBT chemical is manufactured, processed, or otherwise used. Table 7 provides a current list of the PBT chemicals and their thresholds.

TABLE 7
PBT CHEMICALS AND
REPORTING THRESHOLDS
(pounds/year)

Chemical or Chemical Category	Threshold (Pounds)	2008 REPORTS
Aldrin	100	0
Benzo[g,h,i]perylene	10	10
Chlorodane	10	0
Dioxin and dioxin-like compounds category	0.1 grams	6
Heptachlor	10	0
Hexachlorobenzene	10	1
Isodrin	10	0
Lead *	100	2
Lead and lead compounds *	100	13
Mercury	10	2
Mercury compounds	10	8
Methoxychlor	100	0
Octachlorostyrene	10	1
Pendimethalin	100	0
Pentachlorobenzene	10	2
Polychlorinated biphenyls (PCB's)	10	1
Polycyclic aromatic compounds category	100	14
Tetrabromobisphenol A	100	0
Toxaphene	10	0
Trifluralin	100	0

* Lower Threshold For 2001 Reports

TOTAL 60

PBTs are receiving increased scrutiny as we learn more about them, and reporting of PBTs is being progressively more emphasized. These chemicals are of particular concern because they are not only toxic, but also because they remain in the environment for long periods of time, are not readily destroyed, and accumulate in body tissues. Beginning with reporting year 2001, the thresholds for lead and lead compounds were reduced to 100 pounds, down from the previous 25,000 pounds for manufactured and processed and 10,000 pounds for otherwise used, except lead contained in stainless steel, brass, or bronze alloys.

Beginning with reporting year 2008, dioxin and dioxin-like compounds will have additional toxicity information available. These 17 compounds have a wide range (1.0000 to 0.0003) of toxicity and these values are called the Toxic Equivalent Factor (TEF). Multiplying the TEF by pounds yields the Toxic Equivalent Quantity (TEQ), and these

amounts will be provided along with the original amount reported in pounds. See pages 40-41 for additional detail on dioxins.

Not all of the PBT chemicals released in prior years were reportable, even though it is likely these chemicals were released at, or near, the current reported rate if the facility had no significant change in its operation. For example, 13 facilities reported lead or lead compounds in 2008 compared to seven in 2000. All of these facilities were in operation prior to 2001. Additional release information on all PBTs reported to the Delaware TRI program can be found starting on the following page.

Table 8 shows the results of PBT reporting for 2005-2008 compared to total 2008 TRI data. PBT on-site releases for 2008 comprise about 0.36% of the total TRI on-site releases. Total PBT wastes are about 3.4% of total TRI wastes. Total reported PBT wastes increased by 153,000 pounds (5%) in 2008, largely because of increased transfers to off-site recycle. PBT on-site releases were also higher for 2008 by 12,665 pounds (60%); the increase was almost entirely because of the increased amounts of PBTs disposed of in the Indian River Power Plant on-site landfill. PBT reports could be filed on Form A under certain conditions for 2006-2007, but these conditions were revoked for 2008 and beyond. Six PBT reports were filed using Form A in 2006, and four were filed for 2007; this change had only a small influence (0.45%) in the total amount, although the total of 60 PBT reports is close to the counts of 60-63 for recent years.

TABLE 8
2008 TRI PBT DATA SUMMARY
(IN POUNDS)

	PBTs only 2006	PBTs only 2007	PBTs only 2008	All TRI Chemicals 2008
No. of facilities	26	30	27	68
No. of Form A's	6	4	NA	31
No. of Form R's	54	59	60	287
No. of Chemicals	11	11	11	100
On-site Releases				
Air	4,075.51	4,172	3,716	5,771,173
Water	1,405.18	1,565	1,008	2,796,686
Land	25,309.02	15,270	28,948	885,976
Total On-Site	30,790	21,008	33,673	9,453,836
Off-site Transfers				
POTW's	7	5	4	1,117,335
Recycle	3,451,059	3,127,560	3,322,811	7,535,327
Energy Recovery	0	0	55	3,707,411
Treatment	4	9	0	150,297
Disposal	66,199	113,753	58,847	3,129,281
Total Transfers	3,517,269	3,241,328	3,381,717	15,639,650
On-site Waste Mgmt.				
Recycle	54,993	3	3	10,870,477
Energy Recovery	0	0	0	20,932,200
Treatment	769	858	873	42,281,742
Total on-site Mgmt.	55,762	861	876	74,084,419
Total Waste	3,603,820	3,263,196	3,416,266	99,177,905

Table 9 below shows the amounts of each PBT chemical reported as released by the TRI reporting facilities in 2008. Lead compounds, largely released from coal-fired power plants, made up 94% of the total on-site PBT releases. The Edge Moor/Hay Road Power Plant reported the largest release to air and water, and the Indian River Power Plant reported the largest release to land. Over 84% of the lead compounds transferred off-site was for recycle from Johnson Controls. Additional detail for mercury and mercury compounds is on page 42.

TABLE 9
2008 PBT RELEASE SUMMARY
(REPORTED AMOUNTS IN POUNDS)

2008 PBT CHEMICAL	FORM R REPORTS	ON-SITE RELEASES				TRANSFERS OFF SITE	ON-SITE WASTE MGMT.
		TOTAL AIR	TOTAL WATER	TOTAL LAND	ON-SITE TOTAL		
BENZO (G,H,I)PERYLENE	10	154.9012	5.0000	0.87	160.77	0.60	479.00
DIOXIN AND DIOXIN-LIKE COMPOUNDS	6	0.0210	0.0013	0.00	0.02	2.11	0.00
HEXACHLOROBENZENE	1	0.0935	0.0530	0.00	0.15	131.90	0.00
LEAD	2	267.0000	0.0000	0.00	267.00	220.70	0.00
LEAD COMPOUNDS	13	2,445.2884	990.9300	28,203.00	31,639.22	3,359,123.97	0.00
MERCURY	2	0.4000	5.2210	0.00	5.62	21,965.42	0.00
MERCURY COMPOUNDS	8	617.6000	2.0060	92.00	711.61	85.13	0.00
OCTACHLOROSTYRENE	1	0.0006	0.0010	0.00	0.00	6.80	0.00
PENTACHLOROBENZENE	2	14.7040	0.0110	0.00	14.72	2.30	0.00
POLYCHLORINATED BIPHENYLS (PCBs)	1	0.0051	0.0050	0.00	0.01	3.80	0.00
POLYCYCLIC AROMATIC COMPOUNDS	14	216.0630	5.1100	652.30	873.47	174.42	397.14
TOTALS	60	3,716.0768	1,008.3383	28,948.17	33,672.59	3,381,717.15	876.14

Source: 2008 DNREC Database December 2009

Dioxins are reportable in grams and have been converted to pounds.

Four decimal places used for air and water to show that small amounts are not 0-.

Premcor reported almost the entire amount of on-site PBT chemical waste management with 479 pounds of benzo(g,h,i)perylene and 394 pounds of polycyclic aromatic compounds being treated on-site. Appendix I shows the PBT data detail, listing each PBT chemical and the facilities reporting on it. Also, see additional facility information in the Top 15/Second 15 sections regarding reasons for changes in reports from other PBT-reporting facilities.

Dioxin and Dioxin-Like Compounds

The term “dioxins” is used by the EPA TRI program and in this report to indicate the group of 17 dioxins and dioxin-like compounds (DLC) reportable to TRI, out of a family of several hundred dioxins and dioxin-like compounds, including furans. On May 10, 2007, the EPA Toxics Release Inventory Program issued a final rule expanding reporting requirements for the DLC category. The final rule requires that, in addition to the total grams released for the entire category, facilities must report the quantity for each individual member for each release and waste management activity on a new Form (Schedule 1). The reporting requirements of the final rule apply to the 2008 reporting year beginning January 1, 2008, (for which reports were due July 1, 2009), and to subsequent reporting years.

The reason for this rule is that the toxicity levels of these 17 compounds vary greatly, and some compounds in this group have Toxic Equivalent Factors (TEF) **3,333 times less** than others. Because of this great variation, Toxicity Equivalent Quantities (TEQ) are a way to show toxic chemical amounts on an equal toxicity basis. EPA, and the States if they desire, will use the individual mass quantity data to calculate TEQ amounts (Weight X TEF = TEQ) that will be made available to the public along with the mass data.

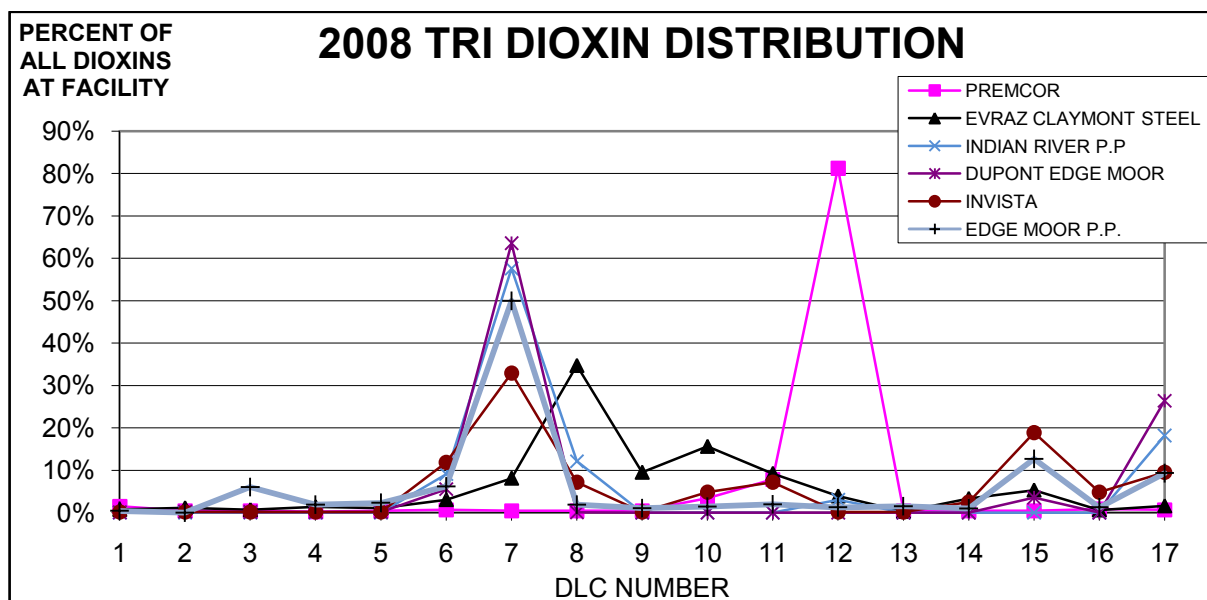
Among the “dioxins” included in TRI reports is the very toxic 2,3,7,8-TCDD dioxin, which is the congener generally of most concern, and most commonly covered by the news media (#1 in the table below). All TRI “dioxins” are reportable in grams, and were converted to pounds for this report since all other chemicals are reported in pounds (1 gram = 0.002205 pounds).

The table below shows the dioxins and dioxin-like compounds that are reportable to TRI, and some basic information about them.

TRI No.	Dioxin Chemical Name	Abbreviated Name	CAS	TEF
1	2,3,7,8-tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	1746-01-6	1.0000
2	1,2,3,7,8-pentachlorodibenzo-p-dioxin	1,2,3,7,8-PeCDD	40321-76-4	1.0000
3	1,2,3,4,7,8-hexachlorodibenzo-p-dioxin	1,2,3,4,7,8-HxCDD	39227-28-6	0.1000
4	1,2,3,6,7,8-hexachlorodibenzo-p-dioxin	1,2,3,6,7,8-HxCDD	57653-85-7	0.1000
5	1,2,3,7,8,9-hexachlorodibenzo-p-dioxin	1,2,3,7,8,9-HxCDD	19408-74-3	0.1000
6	1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin	1,2,3,4,6,7,8-HpCDD	35822-46-9	0.0100
7	1,2,3,4,6,7,8,9-octachlorodibenzo-p-dioxin	1,2,3,4,6,7,8,9-OCDD	3268-87-9	0.0003
8	2,3,7,8-tetrachlorodibenzofuran	2,3,7,8-TCDF	51207-31-9	0.1000
9	1,2,3,7,8-pentachlorodibenzofuran	1,2,3,7,8-PeCDF	57117-41-6	0.0300
10	2,3,4,7,8-pentachlorodibenzofuran	2,3,4,7,8-PeCDF	57117-31-4	0.3000
11	1,2,3,4,7,8-hexachlorodibenzofuran	1,2,3,4,7,8-HxCDF	70648-26-9	0.1000
12	1,2,3,6,7,8-hexachlorodibenzofuran	1,2,3,6,7,8-HxCDF	57117-44-9	0.1000
13	1,2,3,7,8,9-hexachlorodibenzofuran	1,2,3,7,8,9-HxCDF	72918-21-9	0.1000
14	2,3,4,6,7,8-hexachlorodibenzofuran	2,3,4,6,7,8-HxCDF	60851-34-5	0.1000
15	1,2,3,4,6,7,8-heptachlorodibenzofuran	1,2,3,4,6,7,8-HpCDF	67562-39-4	0.0100
16	1,2,3,4,7,8,9-heptachlorodibenzofuran	1,2,3,4,7,8,9-HpCDF	55673-89-7	0.0100
17	1,2,3,4,6,7,8,9-octachlorodibenzofuran	1,2,3,4,6,7,8,9-OCDF	39001-02-0	0.0003

You can see that numbers 1 and 2 have the highest TEF (1.0000), and numbers 7 and 17 have the lowest (0.0003). This is a range of 3,333 to 1. In order to show the toxicity effects of the 17 dioxins on an equal basis, the amounts released in pounds are multiplied by their TEF. The resulting TEQ allows them to be compared on an equal toxicity level.

The graph below shows the distribution of the fractions of the 17 dioxin and dioxin-like compounds reported as on-site releases by each of the six facilities in Delaware that reported on dioxins. You can see how, because of the different processes at the facilities, the fractions of the 17 compounds reported vary between facilities.



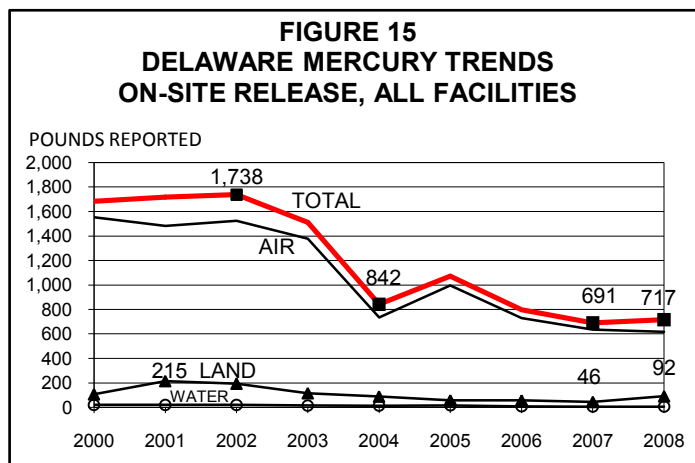
The on-site release amounts in pounds and their corresponding TEQ amounts reported in Delaware were calculated and are presented in the table below, in addition to the pounds released or managed as waste shown in Appendix I. This table provides a summary of information for the six facilities in Delaware that reported on dioxins for 2008. Because of the differences in distribution, you can see that the ranking changes when comparing by pounds or by TEQ.

SORTED BY TOTAL ON-SITE TEQ	TOTAL ON-SITE	ON-SITE	TOTAL ON-SITE	ON-SITE
FACILITY	TEQ, LBS.	TEQ RANK	LBS. RELEASE	LBS. RANK
EVRAZ CLAYMONT STEEL	0.001864	1	0.015091	1
PREMCOR	0.000126	2	0.001047	4
EDGE MOOR/HAY ROAD POWER PLANTS	0.000107	3	0.003739	2
INVISTA SEAFORD	0.000035	4	0.000941	5
INDIAN RIVER POWER PLANT	0.000012	5	0.000728	6
DUPONT EDGE MOOR	0.000007	6	0.001292	3

For example, Premcor, #4 in on-site release **pounds**, is #2 in on-site release **TEQ** because of the relatively higher amounts of dioxin #12 (TEF 0.1000) reported compared to other facilities that reported releases of higher portions of dioxin #7 (TEF 0.0003). DuPont Edge Moor, ranked #3 in on-site pounds, was ranked last in TEQ because the facility reported 90% of its on-site releases as either #7 or #17, dioxins of the lowest TEF at 0.0003.

Mercury and Mercury Compounds

Mercury (elemental mercury) and mercury compounds are an important part of the PBT category, and this section discusses some of the data in these reports. Overall total mercury and mercury compounds on-site releases in Delaware for 2008 increased by 26 pounds

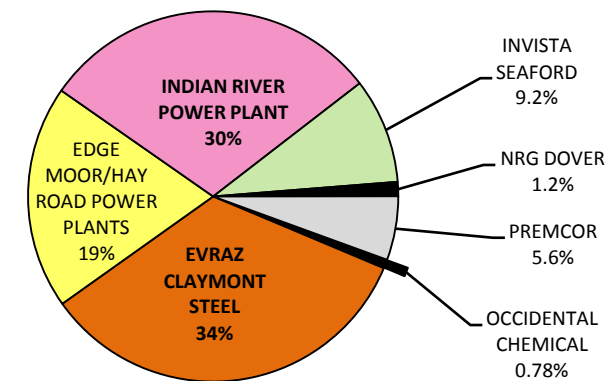


(3.8%) compared to 2007, but have decreased by 59% compared to the peak of 1,738 pounds reported for 2002. Figure 15 shows the combined trend for mercury and mercury compounds. We can also expect significant reductions in the future as a result of Delaware's Multi-P rule (see page 53) starting in 2009.

Reported **elemental mercury** on-site release amounts were lower by 11 pounds as Occidental Chemical transitions through its chlor-alkali plant shutdown. Occidental contributed

virtually all 6 pounds of elemental mercury released on-site in 2008, down from a peak of 1,097 pounds reported in 2000. This amount will continue to decline as the facility completes the shutdown. A majority of elemental mercury (84%) transferred off-site was for recycle and disposal from the closure of this facility. Occidental Chemical sent about 2,000 pounds of mercury off-site for recycling in 2008, following 540,000 pounds in 2005-6 and 20,000 pounds in 2007 as part of the shutdown activity starting November 2005.

**FIGURE 16
2008 ON-SITE MERCURY RELEASES
FROM DELAWARE FACILITIES**



**717 POUNDS REPORTED
MERCURY AND MERCURY COMPOUNDS**

Reports of on-site releases of mercury in **mercury compounds** by Delaware facilities increased 37 pounds (5.5%) in 2008 from normal changes in facility operations and also from the increase in release to land noted on pages 19 and 39 reported by the Indian River Power Plant.

Figure 16 shows the percentage contributed by each of the facilities that reported a mercury or mercury compound release in 2008. Two facilities, Dentsply Caulk Lakeview and Intervet, were required to report because of mercury activity, but did not report any on-site mercury releases for 2008. On-site release amounts for mercury and mercury compounds can also be found in the Appendices on pages F-10-11 and I-2.

Carcinogenic TRI Chemicals

Some chemicals are reportable under TRI because they are either known or suspected human carcinogens. Known human carcinogens are those that have been shown to cause cancer in humans. Suspected carcinogens are those that have been shown to cause cancer in animals. Table 10 contains those known and suspected carcinogens that were reported by Delaware facilities for 2008. Next to each chemical is its International Agency for Research on Cancer (IARC) rating as a: Known (1), Probable (2A), or Possible (2B) carcinogen. Polycyclic aromatic compounds is a class, or group of chemicals, with chemicals in both 2A and 2B IARC classifications. Of the 9.45 million pounds of TRI chemicals reported by facilities as released on-site to the environment in 2008, 3.2% (308,424 pounds) were known or suspected carcinogens. For additional information on cancer rates and causes, please go to the Department of Public Health cancer web site listed in the "For Further Information" section on page 59.

Carcinogens Trends, 1998-2008

Releases on-site of all carcinogens increased 33% (76,454 pounds) compared to 2007 data but have decreased 64% (548,487 pounds) since the peak in 1998. The number of carcinogen reports decreased by nine to 96 in 2008, and the total number of carcinogen chemicals decreased by one to 31 following a large increase in the number of lead and lead compounds reporting facilities in 2001 (because of the reduced reporting threshold). Additional information on lead and lead compounds is in the PBT section on pages 38-39.

TABLE 10
CARCINOGENS REPORTED BY
DELAWARE FACILITIES FOR 2008

CHEMICAL NAME	IARC	NO. OF REPORTS
ARSENIC COMPOUNDS	1	2
BENZENE	1	4
CHROMIUM COMPOUNDS	1	7
ETHYLENE OXIDE	1	2
NICKEL COMPOUNDS	1	6
VINYL CHLORIDE	1	1
1,3-BUTADIENE	2A	2
4,4'-METHYLENEBIS(2-CHLOROANILINE)	2A	2
ACRYLAMIDE	2A	1
CREOSOTE	2A	1
FORMALDEHYDE	2A	1
POLYCHLORINATED BIPHENYLS	2A	1
TRICHLOROETHYLENE	2A	1
POLYCYCLIC AROMATIC COMPOUNDS	2A,B	14
ACRYLONITRILE	2B	1
COBALT COMPOUNDS	2B	3
DICHLOROMETHANE	2B	1
ETHYL ACRYLATE	2B	2
ETHYLBENZENE	2B	4
HEXACHLOROBENZENE	2B	1
LEAD	2B	2
LEAD COMPOUNDS	2B	13
NAPHTHALENE	2B	8
NICKEL	2B	2
NITROBENZENE	2B	1
P-CHLOROANILINE	2B	1
PROPYLENE OXIDE	2B	1
STYRENE	2B	5
TETRACHLOROETHYLENE	2B	1
TOLUENE DIISOCYANATE (MIXED	2B	3
VINYL ACETATE	2B	2
TOTAL =		96

Source: 2008 DNREC Database, November, 2009

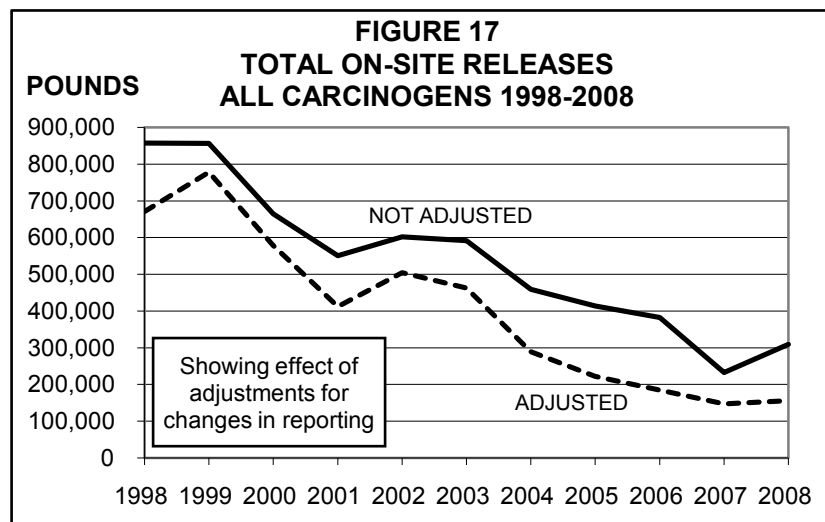
Table 11 on the next page contains amounts unadjusted for changes in reporting requirements. In order to put the trend in uniform perspective, adjustments must be made for changes in reporting requirements during this period. The trends of both unadjusted and adjusted values are shown in Figure 17 on the next page. Chemical reports required during only a portion of the time period because of changes in reporting requirements have been excluded for the entire period in the "adjusted" trend.

TABLE 11
1998-2008 TRI CARCINOGENS
 REPORTED ON-SITE RELEASES, NOT ADJUSTED

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
KNOWN											
AIR	209,094	219,970	209,828	209,295	177,473	123,191	96,562	98,107	66,475	56,287	69,781
WATER	10,246	3,048	4,395	9,114	9,682	9,339	9,817	4,643	5,222	6,435	4,452
LAND	363,793	306,630	258,008	169,197	170,074	312,576	173,414	134,194	143,115	46,021	104,112
KNOWN TOTAL	583,133	529,648	472,231	387,606	357,229	445,106	279,793	236,944	214,812	108,743	178,345
PROBABLE											
AIR	53,558	139,293	55,418	44,326	35,581	24,216	27,417	23,600	18,946	18,628	14,604
WATER	0	0	0	0	0	4	4	4	4	4	5
LAND	0	0	0	0	0	0	0	0	0	8,212	8,661
PROBABLE TOTAL	53,558	139,293	55,418	44,326	35,581	24,220	27,421	23,604	18,950	26,845	23,270
POSSIBLE											
AIR	167,420	186,506	135,946	91,851	189,296	98,699	99,543	104,480	102,414	70,722	77,436
WATER	1,175	290	271	4,873	2,109	1,431	2,308	3,416	1,544	1,655	1,170
LAND	51,625	142	40	21,607	17,475	21,714	49,266	44,500	44,251	24,005	28,203
POSSIBLE TOTAL	220,220	186,938	136,257	118,331	208,880	121,844	151,117	152,396	148,210	96,382	106,809
TOTAL AIR	430,072	545,769	401,192	345,472	402,350	246,106	223,522	226,188	187,836	145,637	161,821
TOTAL WATER	11,421	3,338	4,666	13,987	11,791	10,773	12,129	8,062	6,770	8,094	5,627
TOTAL LAND	415,418	306,772	258,048	190,804	187,549	334,290	222,680	178,694	187,366	78,238	140,976
GRAND TOTAL	856,911	855,879	663,906	550,263	601,690	591,169	458,331	412,943	381,972	231,970	308,424

Source: DNREC TRI 2008 Database, November 2009

These adjustments involve some of the metallic compounds produced from impurities in the fuel and raw materials used by these facilities. Adjustments taking place in this period affected the air, water, and land release amounts. For example, new reports for lead and



lead compounds at their lower reporting thresholds starting in 2001 accounted for 31,716 pounds of exclusions for 2008. Lead and lead compounds reports, under the previous higher thresholds, were not excluded if the facility was already reporting them for 2000 or before. In both the adjusted and unadjusted trends, the downward trend reversed in 2008. The primary reason for this increase is the carcinogens

disposed of on-site at the Indian River Power Plant that had previously been transferred off-site (133,627 pounds for 2008). Additional carcinogen detail is reported in Appendix J.

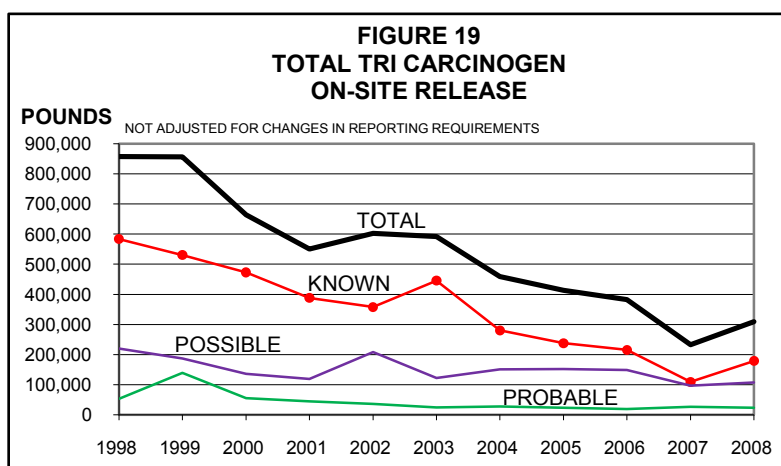
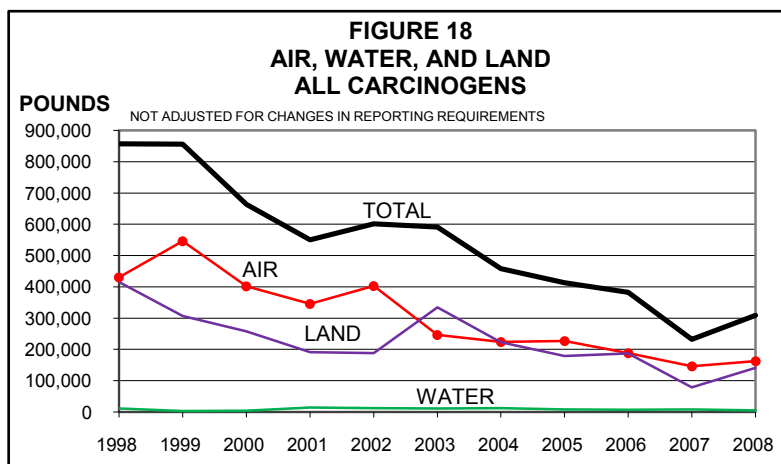
Figure 18 shows a trend of each of the media category releases and the total reported carcinogen release. As in Figure 17, the trend has been down until 2008. Releases to air and land largely influence the total, depending on the year, while releases to water play a much smaller part.

Known Carcinogens

Figure 19 shows the trend of each of the three carcinogen groups and their effect on the total on-site release. On-site releases of known carcinogens are up 64% since 2007, the result of the increase in releases of ash to on-site land from the Indian River Power Plant. Releases to land of known carcinogens are 58% of all known carcinogen on-site releases. Two known carcinogens, nickel compounds and chromium compounds, were reported as released to land for 2008. Fuel combustion

produces ash containing these compounds. Chromium compounds, 96% of which are released to land, and are the highest amount of known carcinogen released, at 77,081 pounds to land, with the Indian River Power Plant contributing over 99% of these releases to land. Nickel compounds, 81% of which are released to land, are the second of the on-site releases in the known carcinogen category at 33,177 pounds. The Indian River Power Plant reported almost all of the nickel compounds released to land for 2008. From 1997-2000, the release to on-site land reports of nickel compounds, a product of fuel combustion at Premcor, greatly influenced the values for known carcinogens. The amount reported in 1997 was 283,000 pounds. Now, the ash and chemicals in the ash from this facility are transferred out-of-state for waste management, and the amount of nickel compounds reported in these transfers was 5,855 pounds, 72% of which was recycled.

Releases of known carcinogens to air are 39% of all known carcinogen on-site releases. Reported releases to air of known carcinogens increased by 24% in 2008 and are now at 33% of the amount reported in 1998. Vinyl chloride, with a total release to air of 50,060 pounds and only reported by Formosa Plastics, is highest in total releases to air in the known carcinogen category. Vinyl chloride contributed 72% of the known carcinogen category releases to air in 2008. Vinyl chloride contributed 31% of all carcinogen releases to air and 16% of carcinogen total on-site releases to air, water, and land in 2008. Benzene releases to air, now almost all from Premcor and Sunoco, have declined from 58,000 pounds in 1995 (from Premcor and the



now closed Metachem facility) to 12,353 pounds in 2008. Benzene made up 18% of the known carcinogen releases to air for 2008 compared to 23% in 1995.

Releases to on-site water of known carcinogens were 3% of the known carcinogen total for 2008. Nickel compounds, mainly released to water from Premcor refinery and the Edge Moor/Hay Road power plant, contributed 84% (3,740 pounds) of all the known carcinogen releases to water (4,452 pounds), with chromium compounds contributing 16% (703 pounds).

Possible Carcinogens

About 63% of the total amount is reported released on-site to air, 37% to land, and less than 0.1% to water. The trend for 2008 is up by 11%, or 10,427 pounds. The highest chemical release in this category is vinyl acetate at 32,794 pounds, 98% of which was reported released by Formosa Plastics. Vinyl acetate reported as released to air by the Formosa Plastics facility increased by 15% for 2008.

Lead compounds was the second highest on-site release of a possible carcinogen, with 31,639 pounds releases on-site. The Indian River Power Plant reported the highest release, 27,058 pounds to land, followed by INVISTA, reporting 1,100 pounds also released to land.

Styrene is the third highest release in the possible carcinogen category. For 2008, Justin Tanks reported 23,953 pounds, 88% of the total styrene release for 2008, and Dow Reichhold reported styrene releases of 1,441 pounds. The remainder was split between smaller releases at three other facilities. Ethylbenzene is the fourth highest amount, at 7,895 pounds reported released on-site. All of these releases were to air, and 95% of the releases were from the Chrysler and Premcor facilities.

Probable Carcinogens

The probable carcinogen total decreased by 3,575 pounds (13%) for 2007-2008 and is now at 23,270 pounds. Probable carcinogens are now at 43% of the 1998 amount. The majority of the 23,270 pounds of five probable carcinogens was reported released to on-site air during 2008. The primary reason for the decrease was the decrease in amounts of trichloroethylene and 1,3-butadiene reported as released on-site from Camdel Metals and Dow Reichhold, respectively. The largest release to air was trichloroethylene, reported by Camdel Metals, and 1,3-butadiene, reported by Dow Reichhold and the Premcor refinery. They combined for 79% of the 14,604 pounds of probable carcinogens released to air. The trend for trichloroethylene release decreased 2,387 pounds (24%) from 2007-2008 and has declined 74% from 1995-2008, down from 29,332 pounds in 1995 to 7,457 pounds in 2008. The trend for 1,3-butadiene, reported by Premcor and Dow Reichhold, is down 1,340 pounds (25%) for 2008 to 4,044 pounds, and is only 5.6% of the 72,439 pounds reported in 1995. Both facilities reported decreases in 1,3-butadiene releases for 2008.

As before, in **Limitations of TRI Data** on Pages 3-4, we urge caution when using this data, as THIS DATA DOES NOT INDICATE AMOUNT OF HUMAN EXPOSURE.

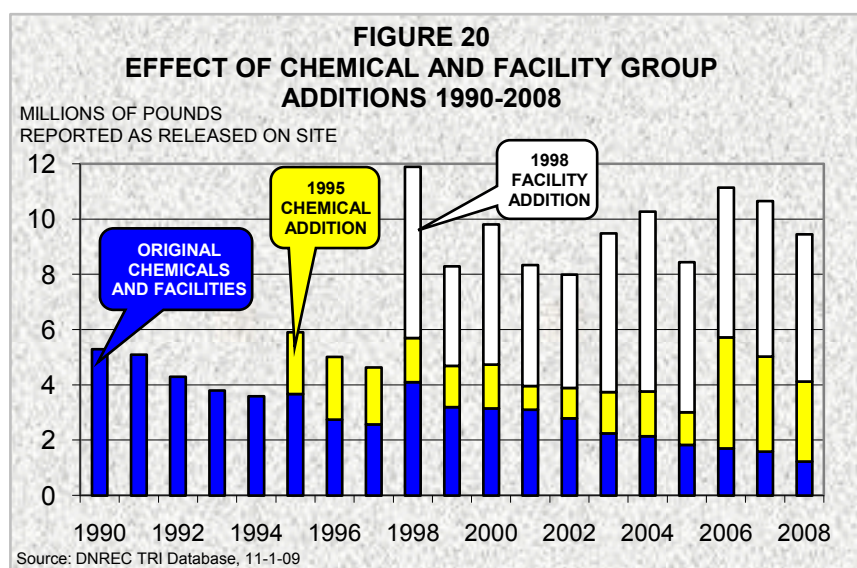
Discussion about specific facilities and their releases can be found on pages 17-37 in the Top 15 and Second 15 Facilities Sections.

Trend Analysis

Effect of Chemical and Facility Group Additions, 1990-2008

As previously mentioned on page 5, significant groups of chemicals and facilities were added to the TRI program at two times over the years. Other smaller groups, or even individual chemicals, were also added or deleted over this time. Figure 20 shows these effects starting in 1990 and following the trend of each group since it was added to the TRI program. Data from the beginning of the TRI program in 1987-89 is excluded because reporting requirements changed significantly and a valid comparison of this data with later data is not feasible.

The trend of each group and the reports affecting the trends will be discussed in the following areas of this Trends Analysis section. All groups show generally decreasing trends over time, but in the group of chemicals added in 1995, a Premcor report for nitrate compounds in the amount of 2.7 million pounds for 2006 caused an increase of 2.9 million pounds for that group. The table below shows



the amount reported in millions of pounds for each group at the time it was added, the 2008 reported amount, and the amount of change since the time it was added. If each group had remained constant at the time of its addition, amounts reported for 2008 would be 13.7 million pounds instead of the 9.45 million pounds actually reported for 2008. The reporting facilities in Delaware have effected a reduction of 4.28 million pounds, or 31.2%, in their reported TRI chemical releases since 1990.

GROUP	STARTING YEAR AMOUNT Millions of Pounds	2008 AMOUNT Millions of Pounds	CHANGE SINCE STARTING Millions of Pounds
Original Facilities and Chemicals	5.30	1.23	- 4.07
1995 Chemical Addition	2.23	2.90	+ 0.67
1998 Facility Addition	6.20	5.32	- 0.88
TOTAL	13.73	9.45	- 4.28

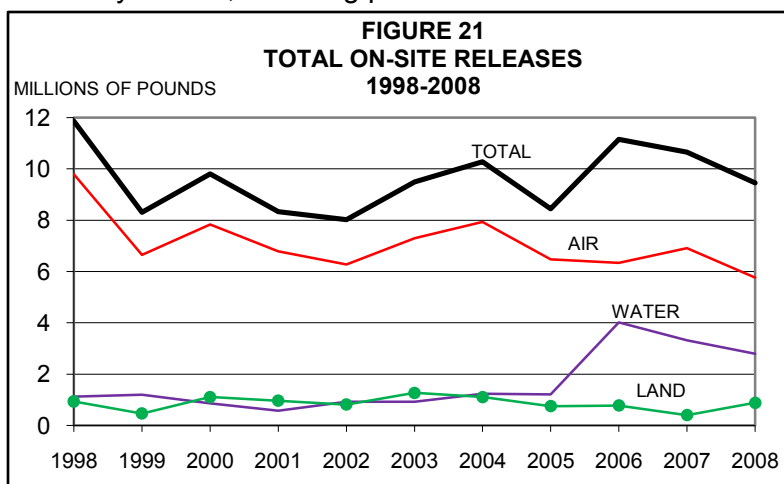
Release and Waste Management Trends, 1998-2008

TRI data is available back to 1987, the first year of the TRI program. Changes in reporting requirements over time have caused an increase both in the number of chemicals and in the number industries subject to reporting. As explained on page 5, significant changes to TRI reporting occurred in 1995, 1998 and 2000, when large increases in chemicals (1995), industries subject to reporting (1998), and reductions in PBT thresholds (2000) occurred. **This section shows all reporting results including these additions.** Comparison of this data with earlier data must be done carefully, as some chemicals and/or industries may not have been required to report over the entire time.

The analysis presented in this section uses 1998 as a base year for presenting trends for all reportable chemicals and facilities and is **not adjusted** for any changes in reporting requirements. Figure 21 below shows the on-site release trends during the 1998-2008 period and Table 12 on the next page shows amounts reported for each of the last 11 years.

On-Site Releases, 1998-2008

On-site releases include emissions to the air, discharges to bodies of water, and releases at the facility to land, including placement in on-site landfills. On-site release amounts decreased



11.3% (1,200,000 pounds) since 2007. Figure 21 shows the trend of on-site releases without adjustments. The trend begins in 1998 when the change in reporting requirements required that a large number of new facilities start to report that year. Significant changes reported for 2007-2008 include the facilities and chemicals shown in the table below.

ACILITY	CHEMICAL	MEDIA	CHANGE (pounds)
Indian River Power Plant	Barium compounds	Land	+270,000
INVISTA	Hydrochloric acid	Air	+70,000
Premcor	Sulfuric Acid	Air	-203,000
INVISTA	Nitrate Compounds	Water	-210,000
Edge Moor/Hay Rd. Power Plants	Hydrochloric Acid	Air	-320,000
Indian River Power Plant	Hydrochloric Acid	Air	-400,000

Some of these changes (higher or lower) like the changes in hydrochloric acid amounts may have been caused by normal year-to-year variations in production levels at the facility or in the chemical content of raw materials. Some changes may also have been caused by improvements in the way facilities estimate amounts. Changes in the reports above are the primary reason for the large changes in the totals for 2007-2008. These changes are also discussed in the Top 15 or Second 15 facility profiles on pages 17-37. In addition, you may contact the facility for a more in-depth discussion of the reasons for specific changes.

TABLE 12
1998-2008 TRI DATA SUMMARY
(IN POUNDS)

NOT ADJUSTED FOR CHANGES IN REPORTING REQUIREMENTS

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
No. of facilities	80	76	80	82	83	85	74	73	70	69	68
No of Form A's	75	72	61	57	55	55	52	53	45	44	31
No of Form R's	277	254	310	316	317	327	310	294	287	295	287
No. of Chemicals	106	101	109	104	106	103	103	103	101	102	100
On-site Releases											
Air	9,796,431	6,651,166	7,841,017	6,796,684	6,281,850	7,308,283	7,935,921	6,478,578	6,341,764	6,920,245	5,771,173
Water	1,126,527	1,197,861	866,312	573,937	928,813	918,650	1,231,061	1,211,798	4,022,175	3,327,675	2,796,686
Land	937,708	462,579	1,103,632	965,666	814,385	1,268,396	1,111,392	752,894	781,701	406,188	885,976
Total On-Site Release	11,860,666	8,311,606	9,810,961	8,336,287	8,025,048	9,495,329	10,278,374	8,443,270	11,145,640	10,654,109	9,453,836
Off-site Transfers											
POTW's	3,286,302	2,996,401	2,199,807	1,575,732	1,201,161	1,452,241	1,466,469	1,514,575	1,421,647	1,243,125	1,117,335
Recycle	12,002,926	9,295,315	8,649,678	8,845,326	9,248,730	8,376,865	9,910,935	11,345,835	8,534,537	8,181,423	7,535,327
Energy Recovery	1,491,543	1,389,936	2,543,840	2,642,626	2,538,090	2,834,075	2,755,903	2,724,080	4,180,596	4,910,600	3,707,411
Treatment	630,761	894,822	901,604	183,567	398,572	370,950	174,893	194,679	237,073	171,044	150,297
Disposal	3,983,506	3,056,466	3,816,862	3,878,689	4,196,691	4,084,899	3,919,638	4,400,538	4,739,232	7,145,314	3,129,281
Total Transfers	21,395,038	17,632,940	18,111,791	17,125,940	17,583,245	17,119,029	18,227,837	20,179,707	19,113,085	21,651,506	15,639,650
On-site Waste Mgmt.											
Recycle	34,549,050	32,671,856	31,188,694	24,133,885	25,033,817	22,404,667	8,772,135	10,079,028	10,594,593	10,945,896	10,870,477
Energy Recovery	16,155,665	22,981,591	29,095,221	25,863,740	15,740,469	16,323,700	23,440,027	19,624,524	17,937,031	20,387,061	20,932,200
Treatment	68,475,327	69,501,151	64,404,879	40,734,134	33,392,650	30,443,585	31,807,455	38,330,991	39,516,068	39,879,302	42,281,742
Total on-site Mgmt.	119,180,042	125,154,598	124,688,794	90,731,759	74,166,935	69,171,952	64,019,617	68,034,543	68,047,692	71,212,259	74,084,419
Total Waste	152,435,746	151,099,144	152,611,546	116,193,986	99,775,229	95,786,309	92,525,828	96,657,520	98,306,417	103,517,874	99,177,905

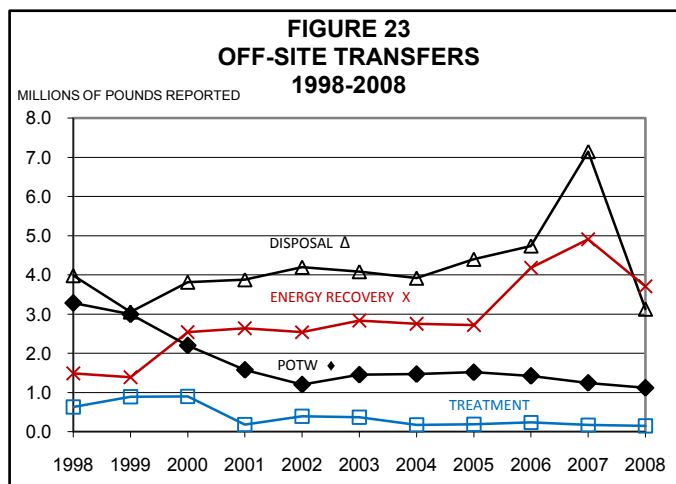
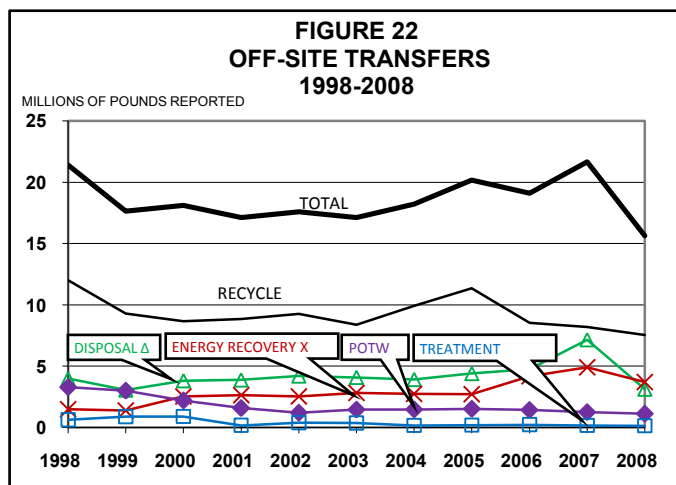
NOT ADJUSTED FOR CHANGES IN REPORTING REQUIREMENTS

SOURCE: DNREC 2008 DATABASE, NOVEMBER 2009



Off-Site Transfers, 1998-2008

An off-site transfer is a transfer of toxic chemicals in wastes to another facility that is physically separate from the reporting facility and may even be out of state. Chemicals are reported as transferred to an off-site facility when they are transported away from the reporting facility for the purposes of treatment at a publicly owned treatment works (POTW), recycling, disposal, energy recovery, or non-POTW treatment facility. Although the off-site transfers may be of less immediate local concern than on-site releases, the transfers to POTWs, treatment, and disposal still represent toxic chemicals in wastes that must be ultimately accounted for.



As noted on page 10 and in Table 12 on page 49, the amounts reported as transferred off-site are over 1.5 times greater than the amounts of on-site releases. Off-site transfers decreased 28% (6.0 million pounds) in 2008, driven by reductions in amounts sent off-site for disposal and energy recovery. Decreases in disposal amounts were seen in reports from the DuPont Edge Moor facility for manganese, chromium, and vanadium compounds and from the Indian River Power Plant for barium and other metallic compounds when the facility returned to on-site disposal for their ash. Decreases in off-site energy recovery amounts were driven by reduced amounts of toluene and methanol from Noramco. General Motors reported a significant reduction in the amount of xylene recycled off-site. Figures 22 and 23 show the trends in amounts of TRI chemicals in wastes transferred off-site for all facilities and chemicals reporting since 1998. To increase clarity, the lower portion (0.0 - 8.0 million pounds) of Figure 22 is expanded in Figure 23. Evraz Claymont Steel reported the only off-site increase greater than 100,000 pounds, with an increase in recycle for lead compounds.

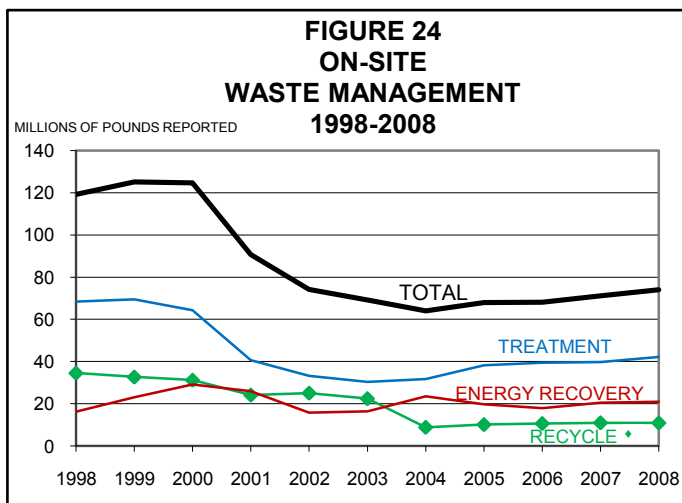
For comparison, please look at the corresponding values in Table 12. Significant changes affecting the off-site transfer trends in 2008 are:

FACILITY	CHEMICAL	OFF-SITE METHOD	CHANGE (pounds)
DuPont Edge Moor	Manganese Cpds.	Disposal	-2,861,000
Noramco	Toluene	Energy Recovery	-901,000
Noramco	Methanol	Energy Recovery	-298,000
General Motors	Xylene	Recycle	-293,000
Indian River Power Plant	Barium compounds	Disposal	-239,000
Evraz Claymont Steel	Lead Compounds	Recycle	+204,000

On-Site Waste Management, 1998-2008

In some facilities, wastes are managed on-site instead of being sent off-site for processing or disposal. On-site waste management is the processing of chemicals in wastes that do not leave the site of the reporting facility. When chemicals are recycled, recovered for energy, or treated at the facility, they are reported as managed on-site. Although these amounts represent a loss of raw materials and/or finished product to the facility as waste, they are not as much of a threat to the environment as the other on-site categories since these

amounts are treated or recycled and not disposed of or released on-site. There is, of course, the risk that these chemicals may be released accidentally on-site to the environment during the waste management process. Also, most waste management operations are not 100% efficient, so a small portion of the waste being treated in these operations may be released on-site and must be accounted for in the on-site releases reported by the facility. Figure 24 shows the trends for the on-site waste management activities since 1998. The decrease in 2001 was due to several decreases, each of over 1 million pounds, including formaldehyde, methanol, MTBE, zinc compounds, and hydrochloric acid. Recent changes have been less dramatic, although the total on-site waste management amount did increase by 2.9 million pounds, or 4.0%, for 2008.



Some significant changes reported in on-site waste management amounts for 2008 are:

FACILITY	CHEMICAL	ON-SITE WASTE MANAGEMENT METHOD	AMOUNT OF CHANGE (pounds)
DuPont Edge Moor	Hydrochloric acid	Treatment	-2,769,000
DuPont Edge Moor	Chlorine	Treatment	-537,000
Ciba	Methanol	Treatment	+1,022,000
Premcor	Ammonia	Energy Recovery	+1,263,000
Indian River Power Plant	Ammonia	Treatment	+1,740,000
Premcor	Carbonyl Sulfide	Treatment	+2,043,000

These changes were balanced by other smaller increases and decreases from other reports. Total pounds for on-site waste management increased by 4% since 2007, but have decreased by 45 million pounds, or 38%, since 1998. The on-site waste management amount totals are in Table 12 on page 49, and Figure 6 on page 11 shows the relative amounts.

Receiving TRI Chemicals in Wastes

When a facility transfers TRI chemical waste off-site, these wastes go to a receiving facility. Table 13 shows the total amounts of TRI chemicals reported as sent to Delaware facilities from TRI facilities, both in-state and out-of-state, for 2008. None of these receiving facilities in Delaware report to the TRI program based on the reporting requirements shown on pages 2 and 3. Historically, few TRI facilities in Delaware receive wastes from other TRI facilities. The DNREC TRI program does not receive reports from any out-of-state facilities that transfer wastes into Delaware. This data was obtained from the U.S. EPA.

TABLE 13
SUMMARY OF REPORTED TRI TRANSFERS
TO DELAWARE FACILITIES
FROM OTHER TRI FACILITIES IN 2008

(IN POUNDS)

DELAWARE RECEIVING FACILITY	TRANSFERS TO DELAWARE FROM DELAWARE FACILITIES	TOTAL TRANSFERS TO DELAWARE FROM OUT OF STATE FACILITIES	TRANSFERS RECEIVED BY DELAWARE FACILITIES
ASHWORKS DELAWARE CONCRETE PUMP SALES	0	127	127
BRANDYWINE RECOVERY	0	3,686	3,686
CANNON IRON & METAL	55,705	0	55,705
CLEAN EARTH OF NEW CASTLE	605	29	634
COSTAL SUPPLY	1,759	0	1,759
DELAWARE SOLID WASTE AUTHORITY CHERRY ISLAND	21,381	0	21,381
DELAWARE SOLID WASTE AUTHORITY GEORGETOWN	5	0	5
DELAWARE SOLID WASTE AUTHORITY SANDTOWN	78	0	78
DUPONT EXPERIMENTAL STATION	0	16,695	16,695
GEORGE & LYNCH	1,265	0	1,265
KENT COUNTY WASTEWATER TREATMENT PLANT	94,861	0	94,861
KENT SCRAP MEAL	12,232	0	12,232
INDUSTRIAL RESOURCE NETWORK, INC.	0	250	250
INTERNATIONAL PETROLEUM CORP. U.S. FILTER	0	8,711	8,711
MOT POTW	2	0	2
PIGEON POINT LANDFILL	0	1,168	1,168
SEAFORD POTW	629	0	629
VFL TECHNOLOGY CORPORATION	280,473	33,909	314,382
WASTE MANAGEMENT	2,230	0	2,230
WILMINGTON WASTEWATER TREATMENT PLANT	1,014,716	3,898	1,018,614
TOTAL TRI TRANSFERS REPORTED	1,485,942	68,473	1,554,415

Source: U.S. EPA 2008 Data Run, September 18, 2009

The top receiving facility is the Wilmington Wastewater Treatment Plant, receiving TRI chemicals in wastewater from regional customers. VFL Technology in Wilmington received the second highest amount from one in-state and two out-of-state electric generating facilities. The Kent County Wastewater Treatment Plant received the third highest amount from six facilities in the Kent County area. Cannon Iron and Metal received the fourth largest amount, for recycle, from one Delaware customer. The fifth largest amount was to the Cherry Island Landfill in Wilmington, receiving TRI chemicals for disposal from two facilities. These five receiving facilities accounted for over 97% of all TRI chemicals received from in-state and out-of-state TRI facilities.

Pollution Prevention/Reduction Programs in Delaware

The Delaware Pollution Prevention Program in the Department of Natural Resources and Environmental Control (DNREC) facilitates the implementation of pollution prevention by industry, government and society. The Pollution Prevention Program (P2 Program) serves a non-regulatory function to provide information, technical assistance, training, and leadership on issues related to reducing and eliminating the generation of wastes and pollutants. The early years of the P2 Program concentrated on industry and its wastes. In recent years, the program has assisted all aspects of Delaware's society, including expanded efforts to schools, environmental, commercial and service organizations, and to State government itself.

Data for TRI reportable chemicals and other chemicals is becoming increasingly more available to the public. This public awareness has focused attention on the existence and quantity of these chemicals and on their management and possible reduction. Although EPCRA does not require a facility to reduce releases of chemicals reportable under its programs, many companies and facilities are aware of the public availability of the data in this and other EPCRA reports and have implemented programs to reduce or eliminate releases of these chemicals. These programs may take the form of efficiency improvements, reuse, recycling, energy recovery, or material substitutions. The benefits of these programs are reduced raw material and waste disposal costs and reduced risks associated with the toxic chemicals. Also, these reductions demonstrate corporate responsibility to the facility neighbors and improve the corporate image with the public.

There are numerous programs within DNREC that impact the management of TRI chemicals through the issuance of permits or through other regulatory and non-regulatory activities. Most releases reported under TRI are also regulated through air emission, water discharge, and/or land disposal permits. Potential sources of toxics undergo technical reviews through which potential threats to the environment and to human health are reviewed and identified prior to issuance of a permit. For example, the Engineering and Compliance Branch in the Air Quality Management Section enforces a provision in the Clean Air Act Amendment of 1990 that targets the control of hazardous air pollutants (HAPs). Nearly all HAPs are also reportable TRI chemicals. In addition, the Engineering and Compliance staff monitors TRI data to assess whether a facility complies with its Air Permits for TRI chemicals. Another example is the work performed by the Accidental Release Prevention (ARP) program. The ARP staff uses the TRI data to detect possible deficiencies at a facility that might result in an increased probability of an accidental release.

The Solid and Hazardous Waste Management Branch uses the TRI report to measure reductions of releases for the Waste Minimization Priority Chemicals list. The list is a result of EPA's Waste Minimization Program and has measurable goals that Delaware is working to attain. The DNREC Pollution Prevention (P2) Program offers consultations to any generator of hazardous waste that requests it. The consultation is non-regulatory and non-enforcement in nature, and is aimed at helping the company to reduce any and all waste streams, including the priority chemicals.

During 2008, DNREC's Air Quality Management Section monitored ambient air quality at nine locations around the State. For more information, please refer to the "For Further Information" section under the [Delaware Air Quality Report](#) on page 60 of this report.

DNREC has developed a new "Multi-P" regulation (Regulation 1146) that will reduce air emissions from Delaware's coal and residual oil-fired power plants. The reason for the new regulation is to protect public health, safety, and welfare from pollutants which include nitrogen

oxides (NO_x), sulfur oxides (SO_x), and mercury. A review committee made up of DNREC personnel, persons with environmental interests, persons impacted by the emissions from power plants, and power plant owners and operators assisted with the development of the regulation. The reduction in NO_x, SO₂, and mercury emissions will:

1. Reduce the impact of those emissions on public health;
2. Aid in Delaware's attainment of the State and National Ambient Air Quality Standard (NAAQS) for ground level ozone and fine particulate matter;
3. Help address local scale fine particulate and mercury problems attributable to coal and residual oil-fired electric generating units;
4. Satisfy Delaware's obligations under the Clean Air Mercury Rule (CAMR); and,
5. Improve visibility and help satisfy Delaware's EGU-related regional haze obligations.

NATIONAL PERSPECTIVE

The national 2008 TRI report has not been released by the U.S. EPA as of the writing of this report. However, placing the 2008 Delaware reports alongside the 2007 EPA reports yields some rankings that provide a perspective for Delaware in the national TRI picture. Changes in the 2008 national values may change these rankings.

This data shows that Delaware ranks 42nd in the nation in total on-site releases by state for all TRI chemicals. This is 0.28% of the total on-site release amounts nationwide. Releases can also be based on other criteria. Because Delaware has a small population and area, releases are spread over fewer people and a smaller area, increasing the ranking on a per-person or per-square mile basis.

State	Rank, Based on Pounds	Total On-Site Release (Pounds)	Rank, Based on Release Per Person	Rank, Based on Pounds Release Per Square Mile
Alaska	1	584,447,311	1	22
Ohio	2	220,848,671	14	1
Nevada	3	219,220,178	2	11
Delaware	42	9,453,836	23	2

The reported totals for twelve states were each over 100 million pounds in 2007.

For on-site releases, 54 facilities in the nation each released more individually than all the facilities in Delaware combined.

Facility, State	Rank	Total On-Site Release (Pounds)
Red Dog Operations, Alaska	1	533,421,591
Kennecott Copper Mine, Utah	2	128,327,723
Barrick Goldstrike Mines, Nevada	3	47,927,924
All Facilities Combined, Delaware	55	9,453,836

Seventeen facilities each reported over 20 million pounds released on site in 2007.

For on-site release of **dioxins***, Delaware ranked 34th in the nation.

State	Rank	Total On-Site Release (Grams)
Mississippi	1	39,429.78
Utah	2	4,370.40
Tennessee	3	4,218.14
Delaware	34	10.36

The reported totals for each of fourteen states were over 100 grams released on-site in 2007.

* See pages 5, 23 and 40 for notes on "Dioxins." The amounts reported do not differentiate between the highly toxic and the less toxic dioxins and dioxin-like compounds in this chemical group.

Thirty-five facilities each released more **dioxins* on-site** than all the facilities in Delaware combined. One Delaware facility, Evraz Claymont Steel (#45), was in the top 100 for **on-site releases** of dioxins.

Facility, State	Rank	Total On-Site Dioxin Release (Grams)
DuPont Delisle Plant, Mississippi	1	39,077.53
US Magnesium, Utah	2	4,335.93
DuPont Johnsonville, Tennessee	3	4,171.33
Delaware, All Facilities Combined	36	10.36

Sixteen facilities each reported over 50 grams of **dioxins*** released on site in 2007.

*See pages 5, 23 and 40 for notes on "Dioxins." Delaware ranks #9 for **total production** of Dioxins. Almost this entire amount was transferred off-site to a permitted out-of-state landfill.

Eight states produced more dioxins than Delaware.

State	Rank	Production – Dioxin, Grams	Off-Site Transfer – Dioxin, Grams	On-Site Dioxin Release or Disposal - Grams (Rank)
Texas	1	63,953.63	60,945.36	3,008.27 (5)
Mississippi	2	39,492.91	63.13	39,429.78 (1)
Tennessee	4	4,395.48	177.34	4,218.14 (3)
Delaware	9	968.18	957.82 *	10.36 (34)

* This amount ranks Delaware #4 in Off-site transfers by state. Delaware dioxin total production fell from #1 to #9 for 2008, based on the report from the DuPont Edge Moor facility. For more information, read the facility profile on pages 22-23.

Some facilities in Delaware do rank near the top of the national rankings for specific releases. The DuPont Edge Moor facility ranks #4 in the nation for off-site transfer to disposal of dioxin and dioxin-like compounds and #7 for off-site transfer to disposal of manganese compounds. Evraz Claymont Steel ranks #44 for on-site release of dioxins. DuPont Edge Moor ranks #19 for on-site release of carbonyl sulfide. Premcor ranks #4 nationally for all on-site releases for petroleum facilities (NAICS 324xxx), #28 for all U.S. facilities in release of nitrate compounds, #33 for all U.S. facilities for release of cyanide compounds, and #55 for on-site release of propylene. Formosa Plastics ranks #2 in the nation for on-site release of vinyl chloride and #19 for on-site release of vinyl acetate.

The Indian River Power Plant ranks #54 and the Edge Moor/Hay Road Power Plant ranks #98 for on-site release of hydrochloric acid. Delaware is ranked #20 within the state rankings for on-site release of hydrochloric acid. Chrysler ranks #70 for on-site release certain glycol ethers. The Indian River Power Plant ranks #72 within the coal and oil-fired electric generating facilities group (NAICS 2211xx) for total on-site release of all TRI chemicals, and #89 for on-site release of hydrogen fluoride.

No Delaware facility is in the top 100 for on-site release of mercury compounds. Occidental Chemical closed their mercury-related chlor-alkali operation as of November 2005 and no longer ranks in the top 100 for on-site release of mercury (#82 for 2006). As the facility works through closure, it was #4 in the nation for total off-site disposal of elemental mercury for 2008. The State of Delaware ranks #43 within the states for on-site release of mercury and mercury compounds for 2008.

Again, these comparisons are made using the 2008 Delaware TRI data and the 2007 National TRI data, so comparison with the 2008 national amounts may change these rankings.

Nearby Facilities in Adjacent States

Some facilities, although not in Delaware, may be important to the environment in Delaware. These facilities are located near our border and may release TRI chemicals, particularly to the air or water, which may migrate into Delaware. Below is a listing of some nearby facilities with significant TRI release amounts. This data is from the TRI electronic facility Data Release (e-FDR) database using the 2008 reporting year data.

Nearby Facilities in Adjacent States

Facility	State	Chemical	Media	Amount (Pounds)
DuPont Chambers Works, Deepwater	New Jersey	Nitrate compounds	Water	5,311,000 **
DuPont Chambers Works, Deepwater	New Jersey	Sodium nitrite	Water	95,842 **
DuPont Chambers Works, Deepwater	New Jersey	Cyanide compounds	Air	4,602 **
Deepwater Generating Station	New Jersey	Acetonitrile	Air	1,169 **
Eddystone Power Plant, Chester	Pennsylvania	Sulfuric acid	Air	104,185
Sunoco, Marcus Hook	Pennsylvania	Ammonia	Air	50,320
Sunoco, Marcus Hook	Pennsylvania	Benzene	Air	45,956 **
Sunoco, Marcus Hook	Pennsylvania	N-Hexane	Air	48,250 **
Sunoco, Marcus Hook	Pennsylvania	Toluene	Air	182,951 **
Sunoco, Marcus Hook	Pennsylvania	Xylene	Air	116,146 **
Sunoco, Philadelphia	Pennsylvania	Benzene	Air	97,760 **
Sunoco, Philadelphia	Pennsylvania	Cumene	Air	50,561 **
Sunoco, Philadelphia	Pennsylvania	N-Hexane	Air	70,239 *
Sunoco, Philadelphia	Pennsylvania	Toluene	Air	55,141 **
Grace Davison Curtis Bay Works, Baltimore	Maryland	Ammonia	Air	196,700 **
Salisbury Feed & Grain	Maryland	N-hexane	Air	193,000 **
Plymouth Tube, Salisbury	Maryland	Trichloroethylene	Air	74,599 **

* Near the Delaware state total for this chemical

** Exceeds the Delaware state total for this chemical

Facility	State	Chemical	Media	Amount (Pounds)
Brandon Shores Power Plant, Baltimore	Maryland	Hydrochloric acid	Air	18,000,000 **
Brandon Shores Power Plant, Baltimore	Maryland	Sulfuric acid	Air	1,000,000 **
Brandon Shores Power Plant, Baltimore	Maryland	Mercury compounds	Air	550

** Exceeds the Delaware state total for this chemical

As noted on page 4, these amounts do not indicate the amount of human exposure. They do provide a comparison between releases in Delaware and some TRI chemicals released by some nearby facilities in neighboring states.

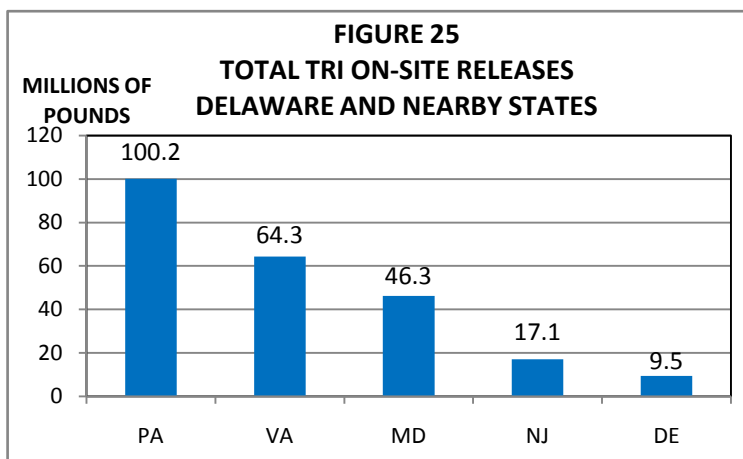


Figure 25 shows the magnitude of TRI on-site releases reported by neighboring states. This figure shows the amounts of on-site releases reported by four nearby states for 2007, the latest year for which state totals are available, and for Delaware for 2008. Pennsylvania reported an amount of 100,158,744 pounds of TRI chemicals released on-site for 2007.

TRI and the Economy

Although many of the changes noted in this report were the result of normal changes within the facilities, some were the result of facility closings. Facilities that have closed in 2008 were Dow Reichhold and Chrysler. Dow Reichhold closed in November and Chrysler closed in December. General Motors closed in July, 2009. These three facilities had declining production during 2008 and earlier years. Dow Reichhold reported steady production levels in recent years, but 2008 was 32% less than 2007. On-site releases reported by Dow Reichhold were lower for 2008, but only by 1,561 pounds (12%). Chrysler reported declining production for 2008 and the prior three years, with 2008 being the sharpest decline, 34% less than 2007. On-site releases reported by Chrysler were lower for 2008, by 34,396 pounds (19%). Although open through 2008, General Motors reported a 66% decline in production with a 77% decline in on-site releases. Clearly, much of these reductions were the result of the facility closings and little the result of new pollution control initiatives. The full effect of these closings will be included in the 2009 report.

The declining economy may have also influenced other facilities that continue to operate. The production level that is reported along with TRI release and waste management data may not be an accurate predictor of emissions or releases because some non-production

activities also create releases independent of those associated with normal production. Some of these activities may even continue in the absence of production, so the index itself is not very accurate in predicting releases. For example, in the Chrysler facility noted above, reported production declined by 34% but releases declined by only 19%, while General Motors reported a 66% decline in production with a 77% decline in on-site releases. For the top 30 facilities, reported production declined by 8.0%, but reported releases declined by 12.5%. Based on this data, it is difficult to accurately separate economic effects from normal year-to-year effects for most facilities.

International “TRI”

The United State's Toxics Release Inventory (TRI) is one of several similar programs established, or being established, by countries around the world. Industrial facilities in these countries are required to report their emissions and other waste management of toxic chemicals to databases in their respective countries. These databases are designed to track the quantities of chemicals that are released to the air, land or water, or transferred to another site for recycling, treatment or disposal. The term used internationally for these TRI-like systems is Pollutant Release and Transfer Register (PRTR). Corporate leaders, environmental advocates, policy makers and the public alike can use this PRTR information to track pollution performance and develop strategies to reduce emissions and protect our shared environment and improve quality of life. The web site for these PRTR programs is <http://www.prtr.net/>

Each country that develops a PRTR often expands on or modifies these basic elements. The U.S. TRI, for example, provides the public with data for on-site waste management of chemicals. The Canadian PRTR, called the National Pollutant Release Inventory (NPRI) collects data on many of the same chemicals on the US TRI list, including dioxins and PACs, but also on Criteria Pollutants (CO, NO_x, SO₂, particulate matter >100 microns, >10 microns, and >2.5 microns, and VOCs). Mexico implemented a mandatory PRTR, Registro de Emisiones y Transferencia de Contaminantes (RETC), which reported for the first time for 2004, but fewer chemicals are reported at this time.

In North America, the governments of the U.S., Canada and Mexico are working together to improve the ability to compare data from their three PRTR systems. This work is coordinated by the North American Commission for Environmental Cooperation (NACEC), an organization created with the North American Free Trade Association (NAFTA). The NACEC's work includes publishing an annual report titled *Taking Stock* that compiles and compares the PRTR data, and operating a searchable website of comparable North American PRTR data.

European countries, Japan, and Australia also have their own Pollution Inventory programs. Reporting requirements, including reportable chemicals, reporting thresholds, and reporting dates, for these programs vary by country.

FOR FURTHER INFORMATION

Access to the TRI Files - DNREC is responsible for collecting, processing, and distributing information submitted by Delaware facilities under the TRI program. This 2008 TRI report may be viewed at: <http://www.serc.delaware.gov/reports.shtml>. Additional information not contained in this report is available to the public through the EPCRA Reporting Program located within DNREC. A second, less technical data summary is available at the same location. A searchable database is located at: <http://www.serc.delaware.gov/services/search/index.shtml>.

The reports submitted by facilities are available for review through the Freedom of Information Act (FOIA) process from DNREC's EPCRA Reporting Program located at 156 South State Street in Dover. Custom reports can also be generated from the database. For information on placing a request, call the TRI Coordinator at (302) 739-9405 during business hours. An on-line FOIA application is also available at: http://www.dnrec.state.de.us/air/aqm_page/foia.htm.

Chemical Data Fact Sheets - A two-page fact sheet is available for most TRI chemicals reported in Delaware and contains information on chemical characteristics, health hazards, and ecological effects. The two-page fact sheets (ToxFAQ's) are available upon request from DNREC's TRI program or available through the Agency for Toxic Substances and Disease Registry at: <http://www.atsdr.cdc.gov/toxfaq.html>

EPA's TRI Home Page - The TRI home page provides information on the many facets of the TRI program at EPA, including an Executive Summary, Q&A's, a link now to the 2006 TRI data, and later this year to 2008 data, a current list of reportable chemicals, reporting forms, state and Federal program contacts, and various guidance documents available for downloading. This website has many links to other EPA and non-EPA sites associated with TRI: www.epa.gov/tri/.

Toxics Release Inventory Public Data Release - EPA's annual TRI report. It covers information nationwide and provides a good perspective on how Delaware compares to other states: <http://www.epa.gov/tri/tridata/index.htm>. The 2008 edition of this report will be available early 2009 and will be available for review at the DNREC office at 156 South State Street in Dover. It can also be obtained by calling the Federal EPCRA Information Hotline at 1-800-424-9346.

Envirofacts Electronic Warehouse - Envirofacts is an EPA-developed website that provides public access to multiple environmental databases, including TRI. Links are available to data about hazardous waste, water permits, drinking water, Superfund sites, air, water, toxics, and more. On-line queries allow the user to retrieve data and create reports, as well as generate maps: www.epa.gov/enviro.

Right-to-know Network (RTK NET) - Searchable nationwide TRI data is available through RTK NET. RTK NET was established by two non-profit organizations to provide access to TRI and chemical data, link TRI with other environmental data, and exchange information among public interest groups: www.rtknet.org.

Delaware Dept. of Public Health Cancer Rates and Causes - This site provides data and answers to many cancer-related questions: <http://www.state.de.us/dhss/dph/dpc/cancer.html>.

The Office of Pollution Prevention & Toxics is a part of the EPA that:

- Promotes pollution prevention as the guiding principle for controlling industrial pollution;
- Promotes safer chemicals through a combination of regulatory and voluntary efforts;
- Promotes risk reduction so as to minimize exposure to existing substances such as lead, asbestos, dioxin, and polychlorinated biphenyls; and,
- Promotes public understanding of risks by providing understandable, accessible and complete information on chemical risks to the broadest audience possible.

It is also a link to *Risk-Screening Environmental Indicators (RSEI)*. This model was developed by EPA's Office of Pollution Prevention & Toxics as a risk-screening tool that provides a relative comparison of TRI releases. This application is available on CD-ROM or through the Internet. Both of these are available through: www.epa.gov/opptintr.

Delaware's Pollution Prevention Program can be accessed at:
<http://www.dnrec.state.de.us/dnrec2000/p2/>.

Environmental Defense Fund Scorecard - The EDF Scorecard combines scientific, geographic, technical, and legal information from many databases (with emphasis on TRI) to enable users to produce detailed local reports on toxic chemical pollution. Chemical profiles and a map generator are also available through the Scorecard: www.scorecard.org.

Delaware Air Quality Report - The annual air quality report is prepared by the Air Surveillance Branch in the Air Quality Management Section of DNREC. This report presents data gathered from a statewide network of air monitoring stations, and includes analyses, trends, and other information regarding Delaware's ambient air quality. For a copy of the report, or for more information, please call (302) 323-4542. This report is available on-line at: <http://www.awm.delaware.gov/AQM/Pages/AQMPublicationsandReports.aspx> and air toxics information is at: <http://www.awm.delaware.gov/AQM/Pages/DATAS1.aspx>. The EPA site for additional air quality information is: <http://www.epa.gov/oar/oagps/publicat.html>.

Delaware's Department of Natural Resources and Environmental Control has a variety of environmental information, publications, and reports available at:
<http://www.dnrec.delaware.gov/info/pages/ELibrary.aspx>.

In addition to TRI, there are other provisions of the Emergency Planning and Community Right to Know Act (EPCRA), which provide information to the public as well as to local emergency planning and response organizations. Delaware has its own EPCRA statute which established these provisions under State law. For additional information, visit the Delaware EPCRA website at: <http://www.serc.delaware.gov/epcra.shtml>.

Questions or comments regarding the TRI program are welcome. Please direct questions, comments, or requests to:

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